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ABSTRACT

The professional development of teachers is a crucial element of the nation's efforts to improve education. In recent years, these efforts have sought to foster high standards for teaching and learning for all of the nation's children, and almost all states have met federal requirements for developing challenging statewide content standards. Such standards seek a fundamental shift in what students learn. However, children's learning will be transformed only if high standards are reflected in teachers' classroom practice. Education reforms will not succeed without teachers who are immersed in the subjects they teach and who know how to foster both basic knowledge and advanced thinking and problem solving among their students. The Eisenhower Professional Development Program, Title II of the Elementary and Secondary Education Act (ESEA), is the federal government's largest investment that is solely focused on developing the knowledge and skills of classroom teachers. This is the second report of the National Evaluation of the Eisenhower Professional Development Program, Part B (State and Local Activities), a multi-year evaluation being conducted by the American Institutes for Research (AIR) under a contract with the U.S. Department of Education's Planning and Evaluation Service. The first report was based on six exploratory case studies of school districts conducted during the first months of the evaluation. This second report describes the current status of the program, based primarily on data from national probability samples of districts, SAHE grantees (i.e., the institutions of higher education and nonprofit organizations supported through the SAHE component of the program), and teachers, as well as on data from 10 in-depth case studies in 5 states. Contains 140 references. (Author/WRM)

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The National Evaluation of the
Eisenhower Professional Development Program:
State and Local Activities

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Designing Effective Professional Development: Lessons from the Eisenhower Program

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The National Evaluation of the Eisenhower
Professional Development Program
State and Local Activities

U.S. DEPARTMENT OF EDUCATION - OFFICE OF THE UNDER SECRETARY
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DESIGNING EFFECTIVE PROFESSIONAL DEVELOPMENT: LESSONS FROM THE EISENHOWER PROGRAM

December 1999

Prepared for

U.S. Department of Education
Office of the Under Secretary
Planning and Evaluation Service
Washington, DC 20202

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December 1999

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EXECUTIVE SUMMARY
DESIGNING EFFECTIVE PROFESSIONAL DEVELOPMENT: LESSONS FROM THE EISENHOWER PROGRAM

The professional development of teachers is a crucial element of the nation's efforts to improve education. In recent years, these efforts have sought to foster high standards for teaching and learning for all of the nation's children, and almost all states have met federal requirements for developing challenging statewide content standards. Such standards seek a fundamental shift in what students learn. However, children's learning will be transformed only if high standards are reflected in teachers' classroom practice. Education reforms will not succeed without teachers who are immersed in the subjects they teach and who know how to foster both basic knowledge and advanced thinking and problem solving among their students.

The Program: The Eisenhower Professional Development Program, Title II of the Elementary and Secondary Education Act (ESEA), is the federal government's largest investment that is solely focused on developing the knowledge and skills of classroom teachers. The program is key to meeting the U.S. Department of Education's objective of ensuring that a "talented and dedicated teacher is in every classroom in America".[1] Part B of the Eisenhower Professional Development Program, with a 1999 appropriation of about $335 million, provides funds through state education agencies (SEAs) to school districts, and through state agencies for higher education (SAHEs) to institutions of higher education and nonprofit organizations. These funds primarily support professional development in mathematics and science.

The Evaluation Report: This is the second report of the National Evaluation of the Eisenhower Professional Development Program, Part B (State and Local Activities), a multi-year evaluation being conducted by the American Institutes for Research (AIR) under a contract with the U.S. Department of Education's Planning and Evaluation Service. The first report was based on six exploratory case studies of school districts conducted during the first months of the evaluation.[2] The purpose of that report was to obtain an initial description of the program and the issues that it faced in different local contexts. This second report describes the current status of the program, based primarily on data from national probability samples of districts, SAHE grantees (i.e., the institutions of higher education and nonprofit organizations supported through the SAHE component of the program), and teachers, as well as on data from 10 in-depth case studies in five states. The third report of the evaluation, to be issued in early 2000, will augment the results reported here with a longitudinal account of teachers' experiences in Eisenhower and other professional development activities and resulting changes in their teaching practices.

THE POLICY CONTEXT

In response to public concerns about education, state and local governments have taken steps to increase children's achievement in school. Many states and school districts have adopted rigorous content standards, as well as student performance standards, which describe the breadth and depth at which students should master content.[3] The federal government, too, has moved to support states in their development of content and student performance standards.

National, state, and local efforts to improve education are intended to create a fundamental shift in what students learn and how they are taught. The success of such ambitious education reform initiatives hinges, in large part, on the qualifications of teachers. However, while teachers generally support high standards for teaching and learning, many teachers are not prepared to implement teaching practices based on high standards.[4] Many teachers learned to teach using a model of teaching and learning that focuses heavily on memorizing facts, without also emphasizing deeper understanding of subject matter.[5]

As a result, teacher professional development is a major focus of systemic reform initiatives.[6] The need for high-quality professional development that focuses on subject-matter content and how students learn that content is all the more pressing in light of the many teachers who teach outside of their areas of specialization.[7] In 1998, 12 percent of science teachers of students in grades 7-12, and 18 percent of mathematics teachers in these grades, had neither a major nor a minor in their main teaching assignment.[8] This situation is especially true of teachers who teach at-risk students and those who teach in high-poverty schools. In 1998, teachers lacking a major in their primary assignment taught almost a quarter of the classes in high-poverty schools, compared to 14 percent of classes in low-poverty schools.[9]

The Eisenhower Professional Development Program, established in 1984 and reauthorized in 1988 and 1994, aims to support high-quality professional development to help teachers meet the demands of teaching to high standards. Yet, the 1988-89 evaluation of Eisenhower indicated that district-supported activities, which account for the vast majority of program funds, tended to be one-time in-service training events, averaging six hours in length.[10] The 1994 reauthorization intended to shift program-funded activities away from short-term professional development toward longer, more intensive activities.

THE EISENHOWER PROGRAM

The Eisenhower program was established in 1984, and reauthorized as Title II of the Elementary and Secondary Education Act, as amended by the Improving America's Schools Act (IASA) of 1994. The program allocates funds through states to school districts and to institutions of higher education or nonprofit organizations. In fiscal year 1999, $335 million was appropriated for Part B of the program, State and Local Activities. Eisenhower funds are distributed to states according to a formula that weights equally the number of children in the state between the ages of 5 and 17 and the state's allocation under Title I, Part A of the Elementary and Secondary Education Act.[11,12] Eighty-four percent of allocated Title II, Part B funds are distributed to SEAs, with the remaining 16 percent allocated to SAHEs. At least 90 percent of SEA allocations then flow through to local education agencies (LEAs), based on the same formula (equal weights to the school-aged population and the LEA's Title I, Part A allocation).[13] LEAs that receive Eisenhower grants under $10,000 are required to form consortia with other such LEAs, unless the SEA waives the requirement (Section 2204(b)). SAHEs distribute at least 95 percent of their Eisenhower allocations by competitive grants or contracts to institutions of higher education (IHEs) or nonprofit organizations (NPOs) that provide professional development to teachers or prospective teachers. Each SAHE develops priorities and guidelines for the awards based on the state plan for improvement in teaching and learning, which it develops collaboratively with the SEA (Section 2205(a)(2)(A)).

Like its predecessor, the Eisenhower Mathematics and Science Education Program, the reauthorized Eisenhower program focuses on the professional development of mathematics and science teachers. The reauthorized legislation, however, allows states and districts to use funds in excess of $250 million to provide professional development to teachers in other core academic subject areas (Section 2206).[14] In its 1994 reauthorization of the program, Congress made it explicit that Eisenhower-assisted activities should be designed to improve teacher practice, especially for students who are most at risk of school failure.[15]

- **The Eisenhower program is designed to support high-quality professional development activities.** Both the Eisenhower legislation and the program guidance published by the Department of Education (ED) emphasize that the Eisenhower program should support high-quality professional development activities—professional development that is sustained, intensive, and continuing. According to the law, such professional development should reflect recent research on teaching and learning and should provide teachers and other school staff with the knowledge and skills necessary to provide all students with the opportunity to meet challenging standards.

- **The Eisenhower legislation encourages the use of funds to target teachers of at-risk students.** The 1994 legislation requires that state applications and local plans take into account the educational needs of students from historically underrepresented populations. The Eisenhower legislation places special emphasis on addressing the needs of teachers in schools receiving Title I, Part A funds; generally these are schools that have higher rates of poverty than other schools in their districts.

The reauthorized program includes a number of procedures designed to ensure the provision of high-quality professional development, including alignment with district and state standards and assessments, coordination (co-funding and working with schools and professional development providers), continuous improvement (use of indicators and needs assessments), and teacher participation in planning.

- **Districts and SAHE grantees are required to align their Eisenhower-assisted activities with state and local standards and reforms.** Recent efforts to improve education have focused on ensuring that all aspects of the education system—including curricula, assessments, teacher education—be consistent with one another and be geared toward the same goals. Reflecting this focus, the law requires the alignment of Eisenhower-assisted professional development activities with challenging state and local curriculum standards and student assessments.

- **The Eisenhower legislation requires the coordination of supported activities with education reform and professional development efforts funded by federal, state, and local governments and other public, private, and nonprofit organizations and associations.** Such integration of Eisenhower-assisted activities with other reform efforts would presumably strengthen the quality of those activities by gearing them to challenging standards and by allowing several funding sources to be combined to design higher quality activities. The law's requirements for district planning of professional development activities, for co-funding those activities with funds from other programs, and for IHE/NPOs working with schools, school districts, or consortia of districts, all promote linkages between Eisenhower-assisted activities and those funded from other sources.

- **The law encourages the use of continuous improvement strategies to plan and improve Eisenhower-assisted professional development activities, through careful goal-setting and monitoring.** The provisions are intended to foster purposeful planning and tracking of progress by states and localities, supported by state and district performance indicators, needs assessment, and evaluation.

- **The law also encourages teacher participation in decision-making about how to use funds from the Eisenhower program.** The law encourages districts to include teachers in developing both the state and local plans for professional development, which are required by the law, and the legislation also requires teachers' participation in district needs assessment.

Some of the key goals of the Eisenhower program are summarized in a set of performance indicators prepared by ED, as required by the Government Performance and Results Act (GPRA). This evaluation addresses four of ED's performance indicators for the Eisenhower program, which concern teachers' skills and classroom instruction, sustained professional development, high-quality professional development, and participation of teachers from high poverty schools.[16] In reporting the results of the evaluation, we use our data to describe how well the program is performing on each of the indicators.

THE NATIONAL EVALUATION OF THE EISENHOWER PROGRAM

The evaluation is based on three strands of data collection.

- **The National Profile.** This strand provides information about program goals, strategies, operations, and activities nationwide. During the 1997-98 school year, AIR conducted telephone interviews with a national probability sample of Eisenhower coordinators in 363 school districts and SAHE-grantee project directors in 92 institutions of higher education or nonprofit organizations (IHE/NPOs). We also collected data from a mail survey of a national probability sample of 1,027 teachers who participated in 657 Eisenhower-assisted activities.[17] We use these Teacher Activity Survey data to describe the types of professional development supported with Eisenhower funds and to compare activities sponsored by school districts to those sponsored by SAHE grantees.

- **The Case Studies.** This strand provides detailed information about how the Eisenhower program operates in selected states, school districts, and schools. During the 1997-98 school year, AIR conducted In-Depth Case Studies in 10 school districts—two school districts in each of five states: Kentucky, New York, Ohio, Texas, and Washington. Those case studies supplement six Exploratory Case districts visited during the first year of the evaluation.

- **The Longitudinal Study of Teacher Change.** This strand examines the effects of Eisenhower-assisted and other professional development on teaching practice in mathematics and science. In each of the 10 districts visited for the in-depth case studies, we interviewed and conducted classroom observations of teachers in three schools, for a total of 30 schools. We also surveyed all teachers who teach mathematics or science in those schools at three points in time, gathering detailed information about instruction during the 1996-97, 1997-98, and 1998-99 school years.

These multiple strands of data are designed to produce an integrated portrait of the Eisenhower program and are based on a variety of research methods and relying on data from groups of individuals who view Eisenhower-assisted activities from different vantage points. Data from our telephone interviews with district program coordinators and SAHE-grantee project directors, for example, are backed up by teacher-participant accounts of what they experienced. In addition, the survey results are cross-validated through case study data that are rich in potential to explain the quantitative results from the surveys. Finally, although our national data on the effects of participation in Eisenhower-assisted activities on change in teaching practice are based on teacher self-reports and do not provide direct estimates of change over time, data from the second and third waves of the longitudinal study, to be examined in the evaluation's third report, will provide additional information on teacher change.[18]

EFFECTIVENESS OF EISENHOWER-ASSISTED PROFESSIONAL DEVELOPMENT ACTIVITIES

To measure the effectiveness of Eisenhower-assisted professional development activities, we asked teachers to report on the extent to which participation enhanced their knowledge and skills in six domains: (1) in-depth knowledge of mathematics/science; (2) curriculum; (3) instructional methods; (4) approaches to assessment; (5) use of technology; and (6) approaches to diversity.

Indicator. **Teachers' Skills and Classroom Instruction.** By 1998, more than 50 percent of a sample of teachers will show evidence that participation in Eisenhower-assisted professional development has resulted in an improvement in their knowledge and skills, and by 2000, more than 60 percent will show such evidence. By 1999, more than 50 percent of a sample of teachers in selected sites will show evidence that participation in Eisenhower-assisted professional development has resulted in improved classroom

- **Overall, the results on effectiveness are mixed. When asked directly, many teachers in SAHE-grantee activities report that participation in Eisenhower-assisted professional development led to enhanced knowledge and skills and changes in their classroom teaching practice. Somewhat fewer teachers in districts report that participation in Eisenhower-assisted activities led to these positive teacher outcomes.** (See Exhibit ES.1.)

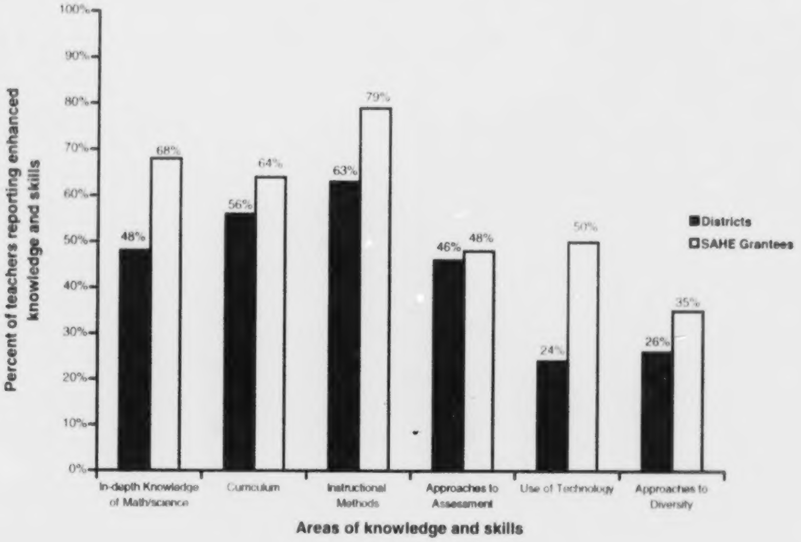
  ⇒ Forty-eight percent of teachers in district activities and 68 percent of teachers in SAHE-supported activities report enhanced in-depth knowledge of mathematics or science; and 63 percent of teachers in district activities and 79 percent of teachers in SAHE-supported activities report enhanced knowledge of instructional methods.

  ⇒ Percentages are lower for the use of technology and approaches to diversity. (About 24 percent of teachers in district activities and 50 percent in SAHE-grantee activities report enhanced knowledge and skills in technology; 26 percent in district activities and 35 percent in SAHE-grantee activities report enhanced knowledge and skills in approaches to diversity.)

  ⇒ SAHE-grantee activities meet ED's standard for changes in teachers' knowledge and skills (see box) in four of the six domains measured by the evaluation, and district activities meet this standard for two domains.

EXHIBIT ES.1

Percent of Teachers Reporting Enhanced Knowledge and Skills Due to Participation in Eisenhower-assisted Professional Development Activities (District n=731 to 750, SAHE Grantee n=233 to 240)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first bar shows that 48 percent of the teachers who participated in district activities report their in-depth content knowledge and skills have been enhanced substantially as a result of professional development. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program. Due to difference in missing data across items, the district n ranges from 731 to 750; the SAHE Grantee n ranges from 233 to 240.

- **SAHE-grantee activities meet benchmarks for reported teacher outcomes set by other exemplary professional development programs.**

  ⇒ A comparison of our data for SAHE-grantee activities with the results obtained for 34 exemplary summer institutes in mathematics and science, supported by the National Science Foundation, the Department of Education, and other agencies, indicates that teachers participating in SAHE-grantee activities report enhancement of knowledge and skills in mathematics and science content roughly comparable to the results for the 34 exemplary activities.[19] Teachers participating in district Eisenhower activities show weaker results than do teachers in the 34 exemplary activities.

26

THE QUALITY OF EISENHOWER-ASSISTED ACTIVITIES

We measured the quality of Eisenhower-assisted activities based on six features of best practice that were identified through a review of the available research on professional development and the opinions of expert practitioners:[20]

- the form or organization of the activity—that is, whether the activity is organized as a **reform type**, such as a study group, teacher network, mentoring relationship, committee or task force, internship, individual research project, or teacher research center, in contrast to a traditional workshop or conference;
- the **duration** of the activity, including the total number of contact hours that participants are expected to spend in the activity, as well as the span of time over which the activity takes place;
- the degree to which the activity emphasizes the **collective participation** of groups of teachers from the same school, department, or grade level, as opposed to the participation of individual teachers from many schools;
- the degree to which the activity has a **content focus**—that is, the degree to which the activity is focused on improving and deepening teachers' content knowledge in mathematics or science;
- the extent to which the activity offers opportunities for **active learning**—that is, opportunities for teachers to become actively engaged in the meaningful analysis of teaching and learning, for example, by reviewing student work or obtaining feedback on their teaching; and
- the degree to which the activity promotes **coherence** in teachers' professional development, by encouraging the continued professional communication among teachers, and by incorporating experiences that are consistent with teachers' goals and aligned with state standards and assessments.

- **Most Eisenhower-assisted activities are traditional in form, such as workshops, courses, or conferences. Relatively few Eisenhower-assisted activities are reform types of activities, such as study groups, networks, or mentoring relationships.**
  - ⇒ About 79 percent of teachers in district activities are in traditional types of activities—primarily workshops and conferences. About 76 percent of teachers in SAHE-grantee activities are also in traditional activities—primarily workshops and college courses.
  - ⇒ About 22 percent of teachers in district activities and 26 percent in SAHE-grantee activities are in reform activities, including teacher networks, study groups, mentoring, committees and task forces, internships, and resource centers.

- **On average, SAHE-grantee activities are of longer duration than district activities.**

  ⇒ The average amount of time teachers in district activities report spending in Eisenhower-assisted activities is 25 hours, compared to 51 hours for teachers in SAHE grantee activities. The average length of district activities, in hours, has approximately doubled since the last evaluation was conducted in 1988-89.[21]

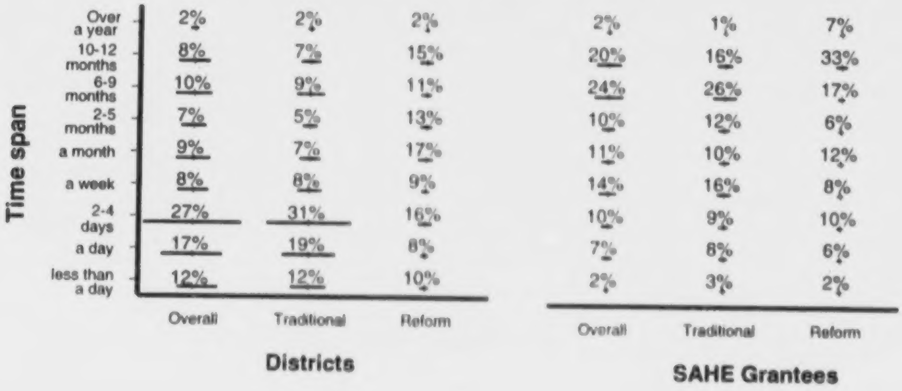
  ⇒ A higher percentage of SAHE-grantee activities than district activities span an extended period of time. For example, 46 percent of teachers in SAHE-grantee activities are in activities lasting at least six months, including 2 percent lasting more than one year, 20 percent lasting 10-12 months, and 24 percent lasting 6-9 months. (See Exhibit ES.2.) Twenty percent of teachers in district activities are in activities lasting at least six months.

  ⇒ ED's performance indicator for sustained professional development requires at least 35 percent of teachers to be in activities that extend over the school year. If "lasting at least six months" is used as the standard, then district activities do not yet meet the standard, while many SAHE-grantee activities exceed the standard by a substantial amount.[22]

***Indicator*. Sustained Professional Development.** By 1998, 35 percent of teachers participating in district-level Eisenhower-assisted activities will participate in activities that are a component of professional development that extends over the school year; by 2000, over 50 percent will.

EXHIBIT ES.2

Time Span of Eisenhower-assisted Activities, as Reported by Teachers (District n=766, SAHE Grantee n=244)



***Source*:** Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
***How to read this exhibit*:** The first column shows that 2 percent of the teachers who participated in district activities were engaged in the activity over more than a year. Each dot represents one teacher. If more than one teacher reported the same span, the teachers are displayed in a horizontal line with length proportional to the number of teachers. Each column represents the distribution for a particular group of teachers. The number on the top of each line is the percent of teachers participating in the corresponding time span.
***Note*:** "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

- **Relatively few district or SAHE-grantee activities emphasize the collective participation of teachers from the same department, grade level, or school. District activities give more emphasis to collective participation than do SAHE-grantee activities.**

  ⇒ Twenty percent of teachers in district Eisenhower-assisted activities report participating with other teachers in their department or grade level, compared to 7 percent of teachers in SAHE-grantee activities; and 19 percent of teachers in district activities report participating with all teachers in their school, compared to 11 percent of teachers in SAHE-grantee activities.

- **On average, SAHE-grantee activities give more emphasis than do district activities to the last three dimensions of quality—content focus, active learning, and coherence.**

  ⇒ Two thirds of teachers participating in SAHE-supported Eisenhower activities participate in activities that place a major emphasis on **content**, compared to fifty-one percent of teachers in district Eisenhower-assisted activities.

  ⇒ The percentage of teachers reporting a major emphasis on each of 18 separate indicators of **active learning** is higher for SAHE grantees than for districts, but relatively few teachers in either district or SAHE-grantee activities report some elements of active learning. For example, only 5 percent of teachers in district activities and 16 percent of teachers in SAHE-grantee activities report that their teaching was observed by the activity leader.

  ⇒ Teachers in both district and SAHE-grantee activities report that the activities have elements that promote **coherence** with other aspects of their professional experiences. For example, more than three quarters of teachers in both district and SAHE-grantee activities report that their activities are aligned with state and district standards. More teachers in SAHE-grantee than district activities, however, report that their Eisenhower activities built on prior professional development (39 percent compared to 31 percent) or were followed up with later activities (70 percent compared to 53 percent).

  ⇒ ED's performance indicator for high-quality professional development requires that at least 50 percent of teacher participants be in activities reflecting "best practice." The data collected by the evaluation show that district and SAHE-grantee activities meet this standard for some dimensions of high quality but not others. For example, as discussed above, more than 50 percent of teachers in SAHE-grantee and district Eisenhower activities are in activities that place a major emphasis on mathematics and science content, and thus ED's "best practice" standard for high quality is met. But districts do not meet the high quality standard for any of the characteristics of active learning, and SAHE grantees meet the standard for only a few characteristics of active learning.

> ***Indicator.* High Quality.** By 1998, more than 50 percent of teachers participating in district-level, Eisenhower-assisted professional development activities will participate in activities reflecting best practices, including a focus on continuous improvement. By 2000, more than 75 percent will.

- **There is enormous variability in the quality of Eisenhower-assisted activities; thus, some districts are providing the same kinds of high-quality professional development activities that SAHE grantees provide.**

  ⇒ For example, although many district activities are short, 2 percent of teachers in district activities are in activities spanning more than one year, 8 percent are in activities lasting 10-12 months, and 10 percent are in activities lasting 6-9 months. (See Exhibit ES.2.)

  ⇒ That some districts provide activities of extended duration, with collective participation, a major focus on content knowledge, a major emphasis on active learning, and coherence with teachers' other experiences, represents an "existence proof" that it is possible for districts to provide such activities.

  We do not know whether all districts possess the organizational capacity and staffing to provide high-quality professional development. Districts lacking the capacity to plan and implement high-quality professional development themselves may well be able to purchase it (e.g., from institutions of higher education), if they are aware of and insist upon the dimensions of quality we have identified.

- **The average differences in quality observed between district and SAHE-supported activities are associated with corresponding differences in cost.**

  ⇒ SAHE grantees spend more than twice as much per teacher participant as do districts. We estimate that SAHE grantees spend about $512 per participation, in comparison to $185 per participation for districts.[23]

  It is unclear why SAHE grantees spend more money per teacher participation than do districts. The competitive process of the SAHE grants may reward proposals that offer professional development with the six quality features, which are expensive to provide.[24] In addition, compared to SAHE grantees, districts may feel a responsibility to provide professional development to all of their teachers. This may push them in the direction of professional development with lower costs per participation.

- **Districts have met ED's standard for participation of teachers from high poverty schools, but there remains room for improvement (see box).**
  SAHE grantees have not met ED's standard.

  ⇒ Teacher participations in district Eisenhower-assisted activities are slightly more likely to be from high-poverty schools than are teachers in the national teaching force as a whole (23 percent compared to 21 percent).

  ⇒ Teacher participations in SAHE-grantee activities, however, are less likely to be from high-poverty schools than are teachers in the national teaching force (13 percent compared to 21 percent).

> *Indicator.* **High-poverty Schools.** The proportion of teachers participating in Eisenhower-assisted activities who teach in high-poverty schools will exceed the proportion of the national teacher pool who teach in high-poverty schools.

To some extent, the results for districts are encouraging: they indicate that the program has been somewhat successful at targeting resources on teachers of disadvantaged children. But the percentage of teachers from high-poverty schools served by the program is only modestly higher than the rate for the nation, indicating that more progress might be made in this area.

FEATURES OF PROFESSIONAL DEVELOPMENT THAT PROMOTE IMPROVEMENTS IN TEACHING

We used our national probability sample of teachers who participated in Eisenhower-assisted professional development to estimate the strength of the relationships among features of the professional development and self-reported teacher outcomes—enhanced knowledge and skills and changed teaching practice.

- **Activities with the six features of high quality—reform type, duration, collective participation, content focus, active learning, and coherence—promote better self-reported outcomes for teachers than other activities.**

  ⇒ The results provide empirical support for the contention that professional development that emphasizes content knowledge, active learning, and coherence leads to teachers reporting enhanced knowledge and skill and changes in teaching practices. (See Exhibit ES.3.)

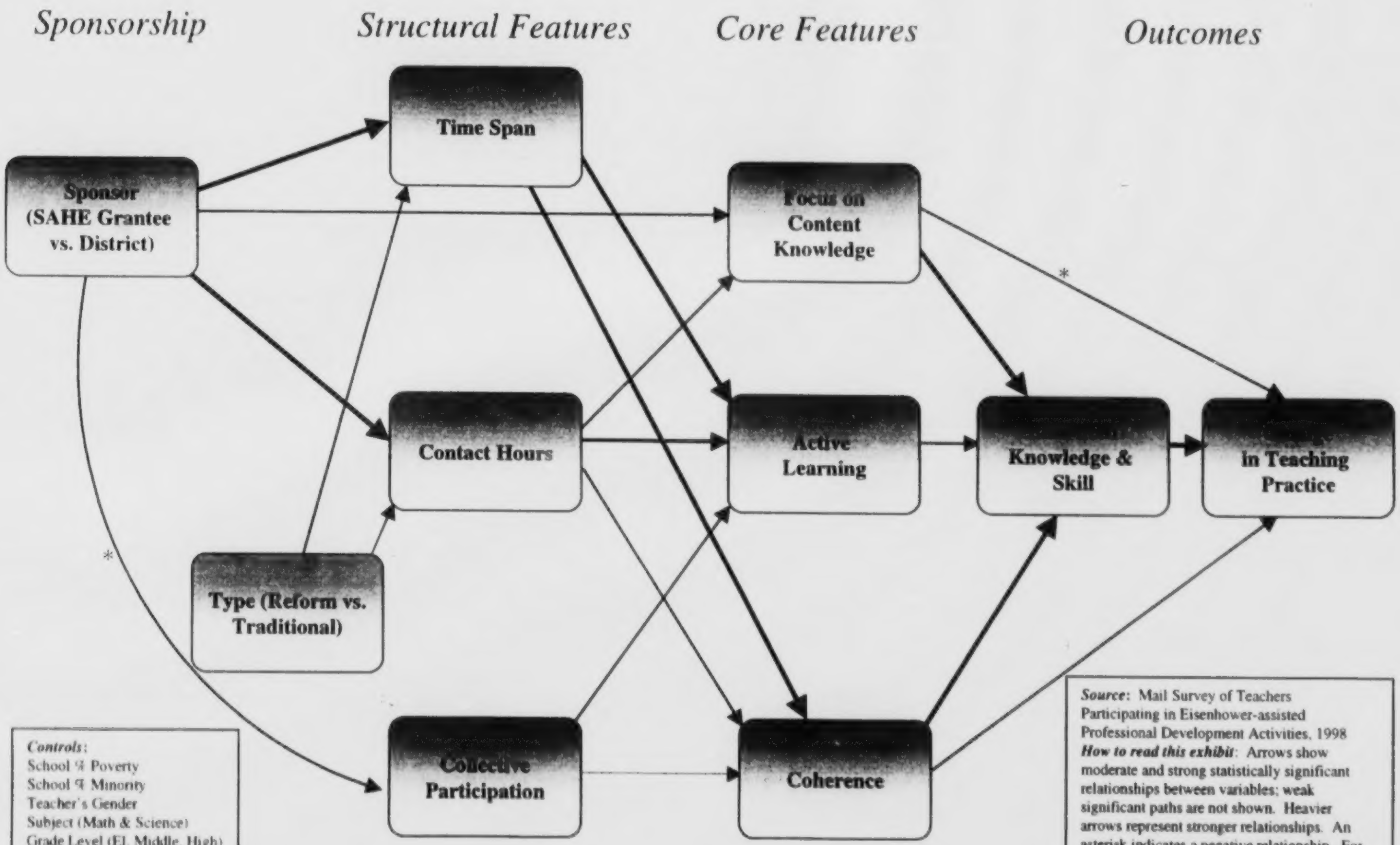
  ⇒ The results also show that activities of longer duration and activities that encourage collective participation of teachers tend to place more emphasis on content than other activities, provide more opportunities for active learning, and provide more coherent professional development. These features in turn promote positive teacher outcomes. *Thus, our results suggest that the emphasis in the legislation on sustained and intensive professional development is appropriate.*

  ⇒ As suggested in the literature on professional development, reform types of activities tend to produce more positive reported outcomes than traditional types, but our results indicate that this effect is largely indirect. That is, *reform activities tend to produce better outcomes primarily because they tend to be of longer duration.* Traditional and reform activities of the same duration tend to have the same effects on reported outcomes.

  ⇒ Our analyses show that *the difference between districts and SAHE grantees in reported enhancement of knowledge and skills and reported change in teaching practice is explained almost entirely by the fact that SAHE grantees place a greater emphasis upon duration, subject-matter content, active learning, and coherence.* In short, if districts placed a greater emphasis upon these characteristics, we hypothesize that teachers would report their knowledge and skill enhanced to the same extent as teachers in SAHE-supported activities, and that they would be just as likely to report changing their teaching practice.

EXHIBIT ES.3

THE RELATIONSHIP OF FEATURES OF PROFESSIONAL DEVELOPMENT TO TEACHER OUTCOMES


Sponsorship
Structural Features
Core Features
Outcomes
Time Span
Sponsor (SAHE Grantee vs. District)
Focus on Content Knowledge
*
Contact Hours
Active Learning
Knowledge & Skill
in Teaching Practice
*
Type (Reform vs. Traditional)
Collective Participation
Coherence

Controls:
School % Poverty
School % Minority
Teacher's Gender
Subject (Math & Science)
Grade Level (El. Middle. High)
In-field Certification
Teaching Experience

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998
How to read this exhibit: Arrows show moderate and strong statistically significant relationships between variables; weak significant paths are not shown. Heavier arrows represent stronger relationships. An asterisk indicates a negative relationship. For the complete path diagram, see Chapter 3 of the full report.

DISTRICT MANAGEMENT OF EISENHOWER-ASSISTED ACTIVITIES

We now turn from describing teachers' experiences in Eisenhower-assisted activities to a description of the ways that districts *manage and operate* their Eisenhower programs. Each district receiving Eisenhower funds generally uses the funds to support a collection of professional development activities. The collection of professional development activities that a district supports with Eisenhower funds can be viewed in its entirety as its "portfolio" of Eisenhower-assisted professional development activities. In our analysis, we examine the factors that influence the quality of the portfolios of professional development activities that districts offer and the extent to which districts engage in efforts to target teachers of high-need students.

The measures we use to characterize the quality of a district's portfolio of Eisenhower-assisted activities are: (1) the percent of the districts' participations in reform types of activities, (2) the average time span of activities (i.e., number of days, weeks, or months), (3) the number of opportunities for active learning in in-district workshops and institutes, and (4) the degree of collective participation in in-district workshops and institutes.[25]

In assessing district management and operations, we focus on the role of several provisions emphasized in the legislation: (1) the *coordination (co-funding)* of Eisenhower-assisted activities with other sources of funding for professional development; (2) the *alignment* of Eisenhower-assisted activities with state and district standards and assessments; (3) the *participation of teachers* and school-level staff in planning Eisenhower-assisted activities; and (4) the use of a process of *continuous improvement*, including monitoring progress against measurable objectives and performance indicators. (See page 4 for more detail on these provisions.)

- **Districts' use of co-funding, alignment, continuous improvement, and teacher involvement in planning leads to higher quality professional development. Thus, the requirements of the legislation concerning these provisions appear to be appropriate.**

  ⇒ Districts that engage in more co-funding of Eisenhower activities with other programs tend to support a greater proportion of reform types of activities than districts that engage in less co-funding, and they tend to provide more opportunities for collective participation.

  ⇒ In addition, districts that engage in more co-funding tend to engage in more extensive continuous improvement efforts and they tend to involve teachers more widely in planning, both of which are related to increased opportunities for active learning.

  ⇒ Districts that align professional development with standards and assessments are more likely to offer reform types of activities.

  ⇒ In addition, the districts that align professional development with standards and assessments are more likely than others to engage in continuous improvement, which is related to increased opportunities for active learning.

These results lead us to conclude that the intentions of the program concerning strategies such as co-funding, alignment, continuous improvement, and teacher involvement in planning are appropriate, in the sense that they lead to higher quality professional development.

- **Among districts where federal programs operate and support professional development, districts are more likely to co-fund with programs that have a mathematics and science focus than with other federal programs.**

  ⇒ For example, as Exhibit ES.4 shows, 44 percent of teachers are in districts with an NSF-funded State Systemic Initiative (SSI); of those, 67 percent are in districts where the SSI supports professional development; and of those, 66 percent are in districts where the Eisenhower project co-funds with the SSI. Among teachers in districts in which Title I, Part A operates and funds professional development, 50 percent are in districts where the Eisenhower project co-funds with Title I; proportions are smaller for other Department of Education programs.[26]

EXHIBIT ES.4

Percent of Teachers in Districts in Which Other Federal Programs Operate, Support Professional Development, and Co-fund with Eisenhower-assisted Activities (n=363)

Federal Program	Percent of teachers in districts where federal program operates in state or district	Percent of teachers in districts where federal program supports professional development in district	In districts where federal program operates and supports professional development, percent of teachers in districts that co-fund with other programs
National Science Foundation			
State Systemic Initiative	44	67	66
Urban Systemic Initiative	17	89	86
Rural Systemic Initiative	4	78	28
Local Systemic Change Initiative	12	91	76
Department of Education			
Title I, A (Disadvantaged)	91	91	50
Title I, C (Migrant Children)	40	63	35
Title III (Technology)	29	91	39
Title VI (Innovative Strategies)	77	73	48
Title VII (Bilingual)	47	82	28
Title IX (Indian)	19	57	5
IDEA (Disabilities)	77	85	22
Goals 2000	86	73	34
School-to-Work	77	85	28
Perkins (Vocational)	74	83	19

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: Forty-four percent of teachers are in districts where coordinators report that a Statewide Systemic Initiative operated in their state in 1997. Of those, 67 percent funded professional development during 1997, and of those, 66 percent co-funded professional development with Eisenhower.

- **Most districts report that their Eisenhower-assisted professional development activities are aligned with standards and assessments.**

  ⇒ Alignment is more likely to be reported for *state* standards and assessments than it is for *district* standards and assessments, and more likely to be reported for mathematics than for science.

  ⇒ Alignment is more likely for standards than for assessments. For example, according to district coordinators, 85 percent of teachers are in districts where the Eisenhower professional development activities are aligned with district mathematics *standards*. In contrast, 69 percent of teachers are in districts where the Eisenhower professional development activities are aligned with district mathematics *assessments*.

The greater alignment for standards than for assessments may reflect the fact that the Elementary and Secondary Education Act (ESEA) requirement of aligned assessments had not yet gone into effect at the time we collected our data.

- **Almost all teachers are in districts that report involving teachers in planning professional development.**

  ⇒ Ninety-nine percent of teachers are in districts that involve teachers in district-level planning of Eisenhower-assisted activities, and 62 percent are in districts in which teachers are involved in a formal school-level committee to plan professional development.

These findings lead us to conclude that the provision of the law that supports teacher participation in planning is relatively well implemented. Still, our case study data reveal that the Eisenhower legislation's 80-20 rule, which calls for at least 80 percent of funds to be used "in a manner that is determined by. . . teachers and staff" and "to the extent practicable, takes place at the individual school site," is not well understood and is sometimes not even known to exist. In particular, it is not clear if the provision means that planning should involve teachers and occur at the school, or whether it is designed to encourage teacher involvement in district-level planning.

- **The use of performance indicators to guide the continuous improvement process is not yet widespread in districts that receive Eisenhower funds.**

  ⇒ Fewer than one in five teachers are in districts that collect data on performance indicators established to guide district professional development efforts.

  ⇒ Only one third of the teachers are in districts that have developed such indicators.

  ⇒ The majority of teachers are in districts whose Eisenhower coordinators are not aware that their state has performance indicators.

Clearly, the development of state and district performance indicators is a goal of the program that is not generally being implemented, at least not yet. There are other ways in which districts show some commitment to continuous improvement. Needs assessments through teacher surveys and informal conversations are common. Nearly every district reports evaluating its professional development activities. These evaluations, however, are frequently based on teacher satisfaction surveys or participation counts. It is less common to use observations of teachers' subsequent classroom practice to evaluate the effectiveness of Eisenhower professional development.

- **District efforts to target teachers of special populations of students have met with very limited success.**

  ⇒ Districts report a strong emphasis on recruiting teachers from high-poverty, low-achieving schools and slightly less emphasis on recruiting teachers from Title I schools.

  ⇒ Despite these reported efforts at targeting, and even though districts with larger numbers of high-poverty students receive more funding, teachers from high-poverty schools are only slightly more likely than others to participate in Eisenhower-funded activities.

Although districts have met the Department of Education's standard for targeting (see page 10), current targeting strategies apparently have limited effectiveness. Perhaps these results are explained, in part, by the fact that most participants in Eisenhower-assisted activities are volunteers. It is possible that districts do not have adequate strategies to shape the incentives and constraints that determine which teachers volunteer.

- **Generally, larger districts are more likely to manage their portfolios better and to provide higher quality professional development than are smaller districts.**

  ⇒ Larger districts are more likely to align their professional development with standards and assessments, to co-fund their projects, and to have a greater commitment to continuous improvement; they also provide activities of longer duration, with more opportunities for collective participation and active learning.[27]

Perhaps large districts have a better infrastructure and more capacity than small districts, which may enable them to provide higher quality professional development. Large districts also may have a greater variety of funding sources in addition to Eisenhower, increasing opportunities for co-funding, and perhaps creating a complexity that demands a commitment to continuous improvement.

SAHE-GRANTEE MANAGEMENT OF EISENHOWER-ASSISTED ACTIVITIES

SAHE grantees are subject to the same provisions for alignment, continuous improvement, and targeting that districts must follow. However, SAHE grantees also are subject to some additional requirements or guidelines. In particular, the 1994 reauthorization emphasizes the importance of coordination between SAHE grantees and districts in planning and providing professional development. Each SAHE grantee is required to enter into an agreement with one or more districts for the provision of professional development. Further, SAHE-grantee projects are shaped by the priorities and guidelines that the SAHE sets in structuring its competition for the Eisenhower awards.[28]

- **SAHE grantees' coordination with districts and continuous improvement efforts lead to higher quality professional development.**

  ⇒ SAHE grantees that coordinate more extensively with districts (e.g., use feedback mechanisms, support and extend district activities, co-fund and involve districts in planning, implementing and monitoring) provide professional development that spans longer amounts of time compared to SAHE grantees that engage in less coordination with districts.

  ⇒ Coordination with districts also has a positive effect on the use of strategies for continuous improvement, which, in turn, increases the active learning opportunities provided in SAHE-grantee activities.

  ⇒ Coordination also is related to greater targeting through its effect on continuous improvement.

  These results for coordination parallel those found for the district sample.

- **SAHE grantees report low levels of implementation of some types of coordination with districts but high levels of most continuous improvement strategies.**

  ⇒ SAHE grantees work closely with districts in several ways, such as communicating with district staff and using district needs assessments, but report low levels of other key components of coordination, such as co-funding and working with the Eisenhower coordinator.

  ⇒ SAHE grantees report moderately high levels of engagement in most continuous improvement efforts, such as using state indicators, conducting needs assessments and evaluations; few SAHE grantees, however, use district indicators in designing their Eisenhower activities.

  These findings suggest that, although the average quality of SAHE-grantee activities is high on some dimensions (e.g., duration and content focus), quality could be further improved by strengthening the coordination between SAHE grantees and districts and giving more emphasis to district indicators.

- **On average, SAHE grantee projects in education departments offer higher-quality activities on several dimensions than projects in mathematics/science departments.**

  ⇒ Education departments sponsor professional development activities that last more than twice the number of hours and span a longer time period than activities sponsored by mathematics/science departments.

  ⇒ Education departments engage in more types of coordination with the districts from which they draw their teachers, and they place more emphasis on continuous improvement than do mathematics/science departments.

- ⇒ Education department projects are especially strong when housed in research/doctoral universities, where they are more likely to put a strong focus on content and provide numerous opportunities for active learning.

The superiority of professional development provided through education departments, in contrast with mathematics/science departments, may be due to the fact that education departments have greater expertise in student and teacher learning of subject matter, as well as experience in coordinating with practitioners. Faculty in these departments are the main contributors to the literature on effective professional development in mathematics and science. Projects in mathematics/science departments, on the other hand, have a strong content focus. Others have noted that, in the training of teachers, quality might be enhanced by better collaboration between educators and scientists. Apparently, the same can be said for continuing teacher education in the form of Eisenhower professional development. Each type of department brings unique strengths to designing and delivering professional development that could be complementary in meaningful collaboration.

IMPLICATIONS FOR PROFESSIONAL DEVELOPMENT

These findings of the National Evaluation of the Eisenhower Professional Development Program have a number of implications for professional development generally and for future Eisenhower legislation and program operations specifically.

First, the program should seek ways to encourage the use of all features of professional development that are related to teacher knowledge and skills, and change in practice. The program should continue emphasizing "sustained and intensive" professional development activities. More specifically, this evaluation suggests that professional development should focus on deepening teachers' *content knowledge* and knowledge of how students learn particular content, on providing opportunities for *active learning*, and on encouraging *coherence* in teachers' professional development experiences. Eisenhower professional development should pursue these goals using activities of greater *duration* and *collective participation*. Clearly, there is considerable room to increase the frequency of these attributes of effective professional development in both district and SAHE-grantee activities. While *reform* professional development is more effective than *traditional* professional development, the advantage to reform activities is explained primarily by greater duration.

Second, the program should develop additional approaches to targeting teachers in high-poverty schools. While increasing the participation of teachers in high-poverty schools is an important goal of the legislation, current approaches to targeting these teachers are insufficient to achieve this goal.

Third, federal indicators might be improved by specifying more clearly the dimensions of high-quality professional development, focusing on annual improvements rather than absolute levels, and setting higher standards. The federal indicators are not as directive as they might be in specifying the dimensions of high-quality professional development. Our analyses suggest that the federal indicators should guide local practice toward greater emphasis upon content knowledge, active learning, and coherence, and that districts should pursue these attributes of professional development through offering activities of greater duration and with more emphasis upon collective participation. In addition, several of the federal indicators are stated in terms of absolute levels to be achieved by a specified date (e.g., "at least 50 percent of teachers"). It would be better to have indicators stated in terms of the amount of improvement needed annually, until an acceptably high level of performance is reached. Finally, the federal indicators set some standards that are too low. For example, in targeting teachers from high-poverty schools, the standard is simply to exceed the national average. Furthermore, in the targeting indicator, participation in Eisenhower professional development is stated as a dichotomous variable (participate or not), while clearly teachers participate in Eisenhower-supported professional development in varying amounts and types.

Fourth, the program should pay attention to building district capacity to foster continuous improvement efforts. If using data to make decisions is to be a serious endeavor, then districts may need assistance in determining the types of data that would be useful and in interpreting them. We believe local evaluation can be done in ways much stronger than current practice, which relies heavily upon participation counts and teacher satisfaction surveys. We recommend that local evaluation of professional development focus on instruction, by assessing the degree to which the professional development is characterized by well-implemented attributes of high-quality professional development: a focus on content, active learning, and coherence, delivered with sufficient duration and collective participation. Such evaluations might be based on a variety of sources of data, including well-designed surveys of participating teachers, and the observation of teachers to assess the extent to which they have made appropriate changes in their instruction. Although the assessment of student achievement might be used as part of a balanced evaluation of professional development, we suggest that local evaluation efforts should not focus on assessing the effects of professional development on student achievement. There are simply too many intervening variables between professional development experiences and subsequent gains in student achievement to make such studies feasible at the local level. Further, collecting and analyzing high-quality data on gains in student achievement is expensive and requires technical skills that may not be present at the local level. Clearly, there needs to be more research that looks at the relationships between features of professional development and gains in student achievement, but this is better done as a part of well-designed major research studies.

Fifth, more information is needed on the characteristics and conditions that give some districts the capacity to provide high-quality professional development. We have speculated that districts could provide the same types of professional development as do SAHE grantees. There are existence proofs of districts doing exactly that. What we do not know from our analyses is the percentage of districts that have the capacity to provide such professional development. Our analyses indicate that larger districts have greater capacity and, to some extent, so do high-poverty districts. This larger capacity may be explained, in part, by their larger district staff and, in part, by their greater Eisenhower funds. Consortia that tie together several small districts into one unit for providing Eisenhower professional development also seem, on average, more effective than small districts. The issue of district capacity is one that should be closely monitored in future research.

Sixth, districts could increase the quality of the professional development they provide by focusing their Eisenhower money on a small number of teachers, rather than spreading it across a large number of teachers. Not surprisingly, high-quality professional development costs more per participant than does lower quality professional development. Districts may feel a greater responsibility to reach a large number of teachers than do SAHE grantees, and this is reflected in the cost per participant. The question is, should districts continue to spread the money from the Eisenhower program across as many teachers as possible? Or, should they focus the money on a small number of teachers, so that they can provide higher quality, more influential professional development? Our results suggest the money should be focused. This recommendation also interacts with the finding about targeting. More effective targeting might, at the same time, provide a rationale for more focused expenditures.

Seventh, one reason that SAHE-grantee professional development is, on average, of higher quality than district professional development may be that SAHE grantees have to compete for funds. We do not know as much about these SAHE-sponsored competitions as we would like. We find that the majority of SAHE grantees have been receiving Eisenhower support for several years. Still, in all cases, IHE/NPOs interested in Eisenhower support must develop a proposal and have it judged worthy of funding. In contrast, districts receive money from the state educational agency on a formula basis, with no competition. Perhaps having districts compete for funds would push them toward higher quality professional development.

Eighth, there is considerable evidence that, on average, education departments in institutions of higher education provide higher quality professional development than do mathematics and science departments. The one exception is that mathematics/science departments in non-research/doctoral institutions focus more on content knowledge than do education departments. We do not have empirical data on interdepartmental collaboration, but, in our case studies, we did not see much evidence of these two types of departments collaborating and combining their expertise to provide high-quality professional development. Lack of collaboration between education and mathematics/science departments is a well-recognized problem in preservice teacher education and may be an issue for in-service education, as well.

Ninth, SAHE-grantee projects should be engaging in higher levels of coordination with districts, as called for in the legislation. The evaluation shows that such coordination is related to the provision of high-quality professional development. Therefore, more attention might be paid to supporting and developing opportunities for SAHE grantees to coordinate and work with districts in mutually beneficial ways—ways that allow grantees to exercise their expertise in developing professional development projects while benefiting from district expertise in serving the needs of their teachers and students.

Finally, the evaluation supports the importance of programs that fund professional development activities within specified subject areas. During the past 15 years, the Eisenhower Professional Development Program has provided continuous support for professional development activities for mathematics and science. This evaluation highlights the importance of the content focus of professional development activities and the role that the Eisenhower program has played in building capacity in these two subjects in school districts. Generic professional development that focuses on teaching techniques without a content focus does not appear to be effective. If the Congress is considering expanding the program, it should consider creating analogous programs in other academic subject areas, rather than eliminating the content focus on mathematics and science.

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[11] Part B allocates funds to the 50 states, the District of Columbia, Puerto Rico, the Bureau of Indian Affairs (BIA), and the outlying areas.

[12] Title I of the Elementary and Secondary Education Act, as amended by the Improving America's Schools Act, is the federal government's largest investment in K-12 education. In FY 1997, Part A of the program, the local educational agency grants program, was appropriated at $6.27 billion. Most of these funds are distributed by formula, based on the number of children who live in poverty, first to states and then to districts. Established in 1965 as one of the cornerstones of President Johnson's War on Poverty, Title I funds educational services for children attending high-poverty schools. With its 1994 reauthorization of the program, Congress made clear its intention that services provided under Title I be linked to high state and local standards.

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[13] Up to 5 percent of the SEA's Title II grant may be used for program administration, and another 5 percent may be used to support professional development activities provided at the state level.

[14] There are two ways that Eisenhower funds can be used to support professional development in other subject areas. First, when the appropriation for the program exceeds $250 million, the additional funds can be used to provide professional development in core subject areas other than mathematics and science. Second, the ESEA legislation allows states and districts to apply to the federal government for waivers that allow them to devote larger percentages of their Eisenhower Professional Development Program grants to other core subject areas.

[15] The term "Eisenhower-assisted activities" reflects the fact that district Eisenhower funds can support professional development activities in a number of ways. Eisenhower funds may be used to support all costs associated with activities, provided that these activities are allowed in the legislation (see Section 2210). Alternatively Eisenhower funds may pay for only some of the allowable costs associated with an activity. This is a common occurrence, because the legislation encourages cost sharing of Eisenhower-assisted professional development activities with those funded by other programs (Section 2209).

[16] This evaluation did not address ED's two performance indicators that address state-level operations of the Eisenhower program, or the performance indicator pertaining to alignment.

[17] Our descriptions of the nature and quality of professional development provided through the Eisenhower program are based on national probability samples with excellent response rates. The national probability sample of district programs and SAHE grantees has an 88 percent response rate for district program coordinators and 87 percent for SAHE grantees. The national probability sample of teachers who participated in Eisenhower professional development activities has a response rate of 72 percent. The 72 percent response rate is especially high when considering the multistage process necessary to complete the sample. District coordinators and project directors in SAHE-grantee institutions had to submit the complete list of professional development activities provided during the prior year and the number of participants. Two activities were selected from each district with probability in proportion to size, and from those, complete rosters of teachers were collected from which two teachers were randomly selected and surveyed.

[18] We also took a number of steps to maximize the validity and reliability of the evaluation's national survey data. For example, most of the survey questions ask teachers and administrators to provide an accounting of behaviors, not direct judgments of quality that might be more likely to be biased. The substantial variation in the responses teachers and district administrators provided to these behavioral items, as well as the consistency in teacher and district administrator responses, tends to bolster our confidence in the validity of the data.

[19] See Carey, N., & Frechtling, J. (1997, March). *Best practice in action: Follow-up survey on teacher enhancement programs.* Arlington, VA: National Science Foundation. Carey and Frechtling indicate that 44 percent of participants in outstanding teacher development programs reported that the programs enhanced their knowledge and understanding of science content to "a great extent" (value of 5 on their 5-point scale). If we isolate the percentage of participants in SAHE-grantee activities who reported that the activity enhanced their mathematics or science knowledge "to a great extent" (value of 5 on the 5-point scale), the percentage is 41 percent. The comparable percent for district activities is 24 percent.

[20] During the past decade, a considerable literature has emerged on professional development, teacher learning, and teacher change (Corcoran, T. B. (1995). *Transforming professional development for teachers: A guide for state policymakers.* Washington, DC: National Governors' Association; Darling-Hammond, L. (1995). Changing conceptions of teaching and teacher development. *Teacher Education Quarterly, 22*(4), 9-26; Hargreaves, A., & Fullan, M. G. (1992). *Understanding teacher development.* London: Cassell. Hiebert, J. (1999). Relationships between research and the NCTM standards. *Journal for Research in Mathematics Education, 30*(1), 3-19; Lieberman, A. (Ed.). (1996). Practices that support teacher development: Transforming conceptions of professional learning. In M. W. McLaughlin & I. Oberman (Eds.), *Teacher learning: New policies, new practices.* New York: Teachers College Press, 185-201; Little, J. W. (1993). Teachers' professional development in a climate of educational reform. *Educational Evaluation and Policy Analysis, 15*(2), 129-151; Loucks-Horsley, S., Hewson, P. W., Love, N., & Stiles, K. E. (1998). *Designing professional development for teachers of science and mathematics.* Thousand Oaks, CA: Corwin Press; Richardson, V. (Ed.). (1994). *Teacher change and the staff development process: A case in reading instruction.* New York: Teachers College; Sparks, D., & Loucks-Horsley, S. (1989). Five models of staff development for teachers. *Journal of Staff Development, 10*(4), 40-57; Stiles, K., Loucks-Horsley,

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S., & Hewson, P. (1996, May). Principles of effective professional development for mathematics and science education: A synthesis of standards, *NISE Brief* (Vol. 1). Madison, WI: National Institutes for Science Education). The research literature contains a mix of large- and small-scale studies, including intensive case studies of classroom teaching, evaluations of programs designed to improve teaching and learning, and surveys of teachers about their preservice and in-service preparation and in-service professional development experiences. In addition, there is a large body of literature describing "best practices" in professional development, drawing on expert experiences. Despite the size of the literature, however, relatively little systematic research has been conducted on the *effects* of professional development on improvements in teaching or on student outcomes, and very little research has been conducted on the relative effects of *alternative forms* of professional development. The research that has been conducted, however, along with the experience of expert practitioners, does provide some preliminary guidance about the characteristics of high-quality professional development (See, in particular, Loucks-Horsley, S., Hewson, P. W., Love, N., & Stiles, K. E. (1998). *Designing professional development for teachers of science and mathematics*. Thousand Oaks, CA: Corwin Press). In particular, several recent studies suggest that professional development that focuses on specific mathematics and science content and the ways students learn such content is especially helpful (Cohen, D. K., & Hill, H. C. (1998). *Instructional policy and classroom performance: The mathematics reform in California* (RR-39). Philadelphia: Consortium for Policy Research in Education; Kennedy, M. M. (1998). *Form and substance in in-service teacher education* (Research monograph no. 13). Arlington, VA: National Science Foundation). We integrated and operationalized the ideas in the literature on "best practices" in professional development to create a set of measures or scales describing the six features of Eisenhower-assisted activities described in the text.

[21] The 1988-99 evaluation collected data on duration from districts rather than teachers, so a comparison of results from the 1988-89 and the current evaluation should be interpreted as providing an indication of the general magnitude of the change rather than a precise numerical estimate. See Knapp, M. S., Zucker, A. A., Adelman, N. E., & St. John, M. (1991, February). *The Eisenhower Mathematics and Science Education Program: An enabling resource for reform (summary report)*. Menlo Park, CA: SRI International, p. 109.

[22] The indicator requires that activities "are a component of professional development that extends over the school year." It is possible that some short-term Eisenhower activities are linked to other activities, and these "sequences" of activities extend over the school year. If so, the percent of Eisenhower-assisted activities extending more than six months may understate the percent of activities that "are a component of professional development that extends over the school year." On our teacher survey, we asked whether the Eisenhower-assisted activities were followed up with additional activities that built upon earlier work; 59 percent of teachers in district activities and 70 percent of teachers in SAHE-grantee activities reported that the Eisenhower-assisted activities in which they participated were followed up with additional activities. We have no information on the duration of the follow-up activities, but assumed that some of the follow-up activities might extend over the school year.

[23] A "participation" is a teacher participant in an Eisenhower-assisted activity. Teachers who participate in more than one activity are counted separately for each activity in which they participate. The dollar per participation figure for districts includes federal Eisenhower dollars only and does not include the 33 percent matching requirement.

[24] We were not able to conduct a systematic analysis of SAHE competitions.

[25] The data from our national sample of teachers show that each of these dimensions is related, either indirectly or directly, to improvements in teachers' knowledge and skills and changes in teaching practice; thus, we consider each of these dimensions as an indicator of high-quality professional development, whether it has a direct effect on teacher outcomes, or operates indirectly (e.g., a reform approach affects teacher outcomes indirectly through its effect on duration).

[26] We have no information on the scope of co-funding (e.g., the amount of money contributed by a particular program in a cost-sharing arrangement).

[27] Throughout our analyses of district data, we tested to see where patterns of Eisenhower support for professional development differ significantly according to the district poverty level or the size of the district. All of our analyses simultaneously control for size and poverty, so any effects are independent of one another. We also tested for the interaction between these two variables.

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[28] Relative to SEAs, SAHEs have a smaller number of grantees, and thus may be able to monitor their grantees' projects to help ensure the implementation of quality activities. However, we did not examine the SAHE's monitoring role.

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CHAPTER 1

OVERVIEW OF THE EISENHOWER PROFESSIONAL DEVELOPMENT PROGRAM AND THE DESIGN OF THE NATIONAL EVALUATION

The professional development of teachers is a crucial element of the nation's efforts to improve education. In recent years, these efforts have sought to foster high standards for teaching and learning for all of the nation's children, and almost all states have met federal requirements for developing challenging statewide content standards.[1] Such standards seek a fundamental shift in what students learn. However, children's learning will be transformed only if high standards are reflected in teachers' classroom practice. Education reforms will not succeed without teachers who are immersed in the subjects that they teach and who know how to foster both basic knowledge and advanced thinking and problem solving among their students (Loucks-Horsley et al., 1998; National Commission on Teaching & America's Future, 1996).

The Eisenhower Professional Development Program, Title II of the Elementary and Secondary Education Act (ESEA), is the federal government's largest investment that is solely focused on developing the knowledge and skills of classroom teachers. The program is key to meeting the U.S. Department of Education's objective of ensuring that a "talented and dedicated teacher is in every classroom in America" (U.S. Department of Education, 1999c). Part B of the Eisenhower Professional Development Program, with a 1999 appropriation of about $335 million, provides funds through state education agencies (SEAs) to school districts, and through state agencies for higher education (SAHEs) to institutions of higher education and nonprofit organizations (SAHE grantees). These funds primarily support professional development in mathematics and science. Congress and the U.S. Department of Education (ED) currently are considering changes to the Eisenhower program as part of the reauthorization of the ESEA. This report, based on a national evaluation of the Eisenhower program, aims to provide information about how the program is operating and how it might be strengthened to inform policymakers as they consider changes to the program during its reauthorization.

In addition to informing policymakers about the Eisenhower program, a second objective of this report is to contribute more generally to knowledge about professional development. The Eisenhower program is a source of funding for professional development activities, not a specific approach to professional development. Allowable activities are wide-ranging and include workshops and conferences, study groups, professional networks and collaboratives, task force work, and peer coaching. Furthermore, Eisenhower funding does not exist in a vacuum. Eisenhower-assisted activities also may receive funding through states, school districts, and other federal programs. Therefore the information in this report about the quality and effects of Eisenhower-assisted activities is also applicable to professional development funded through other sources.

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[1] Title I of the Elementary and Secondary Education Act (ESEA) required that by the 1997-98 school year, each state was to have adopted challenging content standards in at least reading and mathematics, and challenging performance standards that describe students' mastery of the content standards (U.S. Department of Education, 1999b). Forty-eight states, plus Puerto Rico and the District of Columbia, have met federal requirements for developing challenging statewide content standards. Twenty-one states, plus Puerto Rico, have met the requirement for developing student performance standards. States are not required to submit content and performance standards to the U.S. Department of Education—only evidence of their quality and rigor.

Finally, by analyzing features of professional development activities and their effects on teachers, the third objective of this report is to gauge the extent to which federal support for professional development of teachers enhances the quality of teaching practice in the nation's schools. Ultimately, the success of the nation's efforts to improve student learning depends on efforts to improve the quality of teaching.

THE POLICY CONTEXT FOR THE REAUTHORIZED EISENHOWER PROGRAM

The Eisenhower legislation is part of the Elementary and Secondary Education Act (ESEA), and Congress in 1994 took a dramatically different direction for the ESEA's programs. In particular, the focus of Title I, the cornerstone of the ESEA, was to change from a program funding "remediation" activities to one that aims at achieving high standards for all students.[2] Furthermore, the "new" Title I was intended to encourage systemic educational reform through development of state standards and assessments, as well as by supporting school-based education reform through easing provisions for schoolwide projects. As part of ESEA, the Eisenhower program also was re-shaped in 1994 to help move the nation's children toward high standards by improving the quality of teaching.

These dramatic changes in federal education programs responded, in part, to public concerns about the poor performance of U.S. students compared to those in other industrialized countries. In mathematics and science, the Third International Mathematics and Science Study (TIMSS) suggests some explanations for the performance of U.S. students.[3] The TIMSS studies found that, while U.S. children generally have grasped "basics" like arithmetic, many are not learning advanced mathematics and science (Schmidt, McKnight, & Raizen, 1996; Schmidt & Valverde, 1997; U.S. Department of Education, 1998b). The studies also found that curricula in U.S. "schools lacks coherence, focus and rigor, compared to that of other countries" (U.S. Department of Education, 1998b, p.10). Because the curriculum frameworks of many states cover many topics—more than are taught in most other TIMSS countries—teachers often cover topics superficially, without spending enough time for students to master the topics. The curriculum within the U.S. also is less demanding than that of many other TIMSS countries. For example, middle school students in the U.S. are reviewing arithmetic and introductory science while their peers in other countries are studying algebra and geometry, physics, and chemistry.[4] While curricula that emphasize basic skills without also emphasizing more advanced skills may have been sufficient in a manufacturing economy, such curricula appear not to be sufficient in today's or tomorrow's work place.

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[2] Title I of the Elementary and Secondary Education Act, as amended by the Improving America's Schools Act, is the federal government's largest investment in K-12 education. In FY 1997, Part A of the program, the local education agency grants program, was appropriated at $6.27 billion. Most of these funds are distributed by formula, based on the number of children who live in poverty, first to states and then to districts. Established in 1965 as one of the cornerstones of President Johnson's War on Poverty, Title I funds educational services for children attending high-poverty schools. With its 1994 reauthorization of the program, Congress made clear its intention that services provided under Title I be linked to high state and local standards.

[3] In mathematics and science, the subjects that are the primary focus of the Eisenhower program, students fall behind during the course of their school years. According to TIMSS, U.S. fourth-grade students are among the best in the world in science, and above the international average in mathematics. By high school, U.S. students score near the bottom of TIMSS nations in both subjects.

Addressing deficiencies in student performance and in the curricula that students cover requires improvements at all levels of the U.S. education system (Fuhrman, 1993; Goertz, Floden, & O'Day, 1996; Kahle, 1997; Lee, 1997; Loucks-Horsley, 1997; Smith & O'Day, 1991; Webb, 1997a, 1997b). Such improvements are even more necessary because systemic reform efforts are attempting to raise standards of performance for *all* children, especially those from diverse backgrounds who have traditionally performed poorly in school. Preparation of all children for an increasingly knowledge-based economy requires a dramatic overhaul of all aspects of the education system, according to proponents of systemic reform.

In response to public concerns about education, state and local governments have taken steps to increase children's achievement in school. Many states and school districts have adopted rigorous content standards, as well as student performance standards, which describe the breadth and depth at which students should master content (American Federation of Teachers, n.d.; Blank & Pechman, 1995; National Education Goals Panel, 1995; Porter, Archbald, & Tyree, 1991; Porter, Smithson, & Osthoff, 1994). The federal government, too, has moved to support states in their development of content and student performance standards. In addition to the Improving America's Schools Act of 1994 which reauthorized the ESEA, the Goals 2000: Educate America Act, enacted in 1994, provides grants to states to support systemic reform initiatives. The National Science Foundation (NSF) also has invested heavily in supporting systemic education reform initiatives in mathematics and science in states, urban and rural areas, and school districts.[5]

National, state, and local efforts to improve education are intended to create a fundamental shift in what students learn and how they are taught. The success of such ambitious education reform initiatives hinges, in large part, on the qualifications and effectiveness of teachers. Thus, if children are to achieve at levels demanded by the high standards adopted by states and districts, teachers will have to help them do so. Teachers are necessarily at the center of reform, for they must carry out the demands of reform in the classroom (Cuban, 1990). As a result, teacher professional development is a major focus of systemic reform initiatives (Corcoran, 1995; Corcoran, Shields, & Zucker, 1998).

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[4] TIMSS is the largest international comparison of education ever done. In 1995, TIMSS tested the mathematics and science knowledge of half a million students in three different grade levels in 41 countries.

[5] The National Science Foundation sponsors four systemic initiatives: Statewide Systemic Initiatives, concerned with state-level change; Urban Systemic Initiatives (replaced in 1999 by the Urban Systemic Program), for identified urban areas meeting minimum size requirements; Rural Systemic Initiatives, intended to ensure rural areas access to the technology and other educational reform efforts of more populous areas; and Local Systemic Change (formerly Local Systemic Initiatives), primarily concerned with teacher in-service training and development. NSF's systemic initiatives are generally funded in five-year increments; SSI awards can be up to $2 million per year and USI grants are between $400,000 and $3 million per year.

To carry out the demands of education reform, teachers must be immersed in the subjects they teach, and have the ability both to communicate basic knowledge and to develop advanced thinking and problem-solving skills among their students (Loucks-Horsley et al., 1998; National Commission on Teaching and America's Future, 1996). The central elements of systemic reform—high standards, curriculum frameworks, and new approaches to assessment aligned to those standards—generate new expectations for teachers' classroom behaviors, as well as for student performance (Bybee, 1993; National Council for Teachers of Mathematics, 1991; National Research Council, 1996; Webb & Romberg, 1994). To help students learn complex knowledge and skills, teachers must understand the disciplines that they teach, as well as how children learn these disciplines.

However, while teachers generally support high standards for teaching and learning, many teachers are not prepared to implement teaching practices based on high standards (Cohen, 1990; Elmore & Consortium for Policy Research in Education, 1996; Elmore, Peterson, & McCarthy, 1996; Grant, Peterson, & Shojgreen-Downer, 1996; Sizer, 1992; Muncey & McQuillan, 1996). Many teachers learned to teach using a model of teaching and learning that focuses heavily on memorizing facts, without also emphasizing deeper understanding of subject knowledge (Cohen, McLaughlin, & Talbert, 1993; Darling-Hammond & McLaughlin, 1995; Porter & Brophy, 1988). Even when they agree that new teaching approaches are needed, teachers often are unaware that their own knowledge and skills, or teaching practices, are inconsistent with high standards, or that they may not have received enough preparation to implement new approaches effectively.

The continual deepening of knowledge and skills is an integral part of any profession. Teaching is no exception (Shulman & Sparks, 1992; National Board for Professional Teaching Standards, 1989). In the context of the ambitious education reforms being undertaken across the nation, the quality of teachers' professional development has come under increased scrutiny. A large body of literature has emerged focusing on what effective professional development for teachers "looks" like. The literature suggests that traditional approaches to professional development, such as short workshops or attendance at conferences, may foster teachers' awareness or interest in deepening their knowledge and skills. However, such approaches to professional development appear insufficient to foster learning that would fundamentally alter what teachers teach or how they teach it. Yet, for many of the nation's teachers, professional development continues to be characterized by fragmented, "one-shot" workshops at which teachers listen passively to "experts" and learn about topics that are not essential to teaching (National Foundation for the Improvement of Education, 1996). A national survey conducted in 1998 reports that, depending on the subject of the professional development activity, between 44 and 81 percent of teachers reported that professional development activities lasted a total of one to eight hours during the previous 12 months (U.S. Department of Education, 1999a). Even when the professional development focused on "in-depth study in the subject area" of teachers' main teaching assignment, only 56 percent of teachers reported more than eight hours of professional development. Further, a study of professional development in NSF's statewide systemic initiatives found that activities were often of insufficient duration (Corcoran, Shields, & Zucker, 1998).

Professional development that has a substantial number of contact hours and is sustained over a long period of time is thought to have a stronger impact on teaching practice and to be more consistent with systemic reform efforts than professional development of limited duration (Corcoran, 1995; Darling-Hammond, 1995; Hargreaves & Fullan, 1992; Hiebert, 1999; Lieberman, 1996; Little, 1993; Richardson, 1994; Sparks & Loucks-Horsley 1989; Stiles, Loucks-Horsley, & Hewson, 1996).

Conventional wisdom suggests that certain types of professional development activities are more likely than others to offer such sustained learning opportunities. These approaches include: study groups, in which teachers are engaged in regular, structured, and collaborative interactions around topics identified by the group; coaching or mentoring arrangements, where teachers work one-on-one with an equally or more experienced teacher; networks, which link teachers or groups, either in person or electronically, to explore and discuss topics of intent, pursue common goals, share information, and address common concerns; and immersion in inquiry, where teachers engage in the kinds of learning that they are expected to practice with their students (Loucks-Horsley et al., 1998). Compared to workshops, these types of activities are typically thought to be longer, to allow teachers the opportunity to practice and reflect upon their teaching, and to be more embedded in ongoing teaching practices. A 1998 national survey found that many teachers believe that job-embedded, collaborative professional development activities, such as common planning time, being formally mentored by another teacher, or networking with other teachers outside the school, are more helpful than traditional forms of professional development (U.S. Department of Education, 1999a).

Although there is a large literature on professional development, little high-quality research has been conducted on the relationship between characteristics of professional development and change in teachers' classroom teaching practice, and still less has been conducted on the relationship between characteristics of professional development and gains in student achievement. The limited evidence available suggests that the most important aspect of high-quality professional development activities is the degree to which they focus on the content that teachers must teach. Two recent studies of professional development—a research synthesis of professional development in mathematics and science commissioned for this evaluation, as well as a study of professional development and student mathematics achievement in California—came to the same conclusion. These reviews found that professional development focusing on subject matter content and how children learn that content is effective in boosting student achievement. Kennedy (1998) found that professional development for teachers that focuses on how their students learn a particular mathematical or scientific idea was more effective in boosting these students' achievement than professional development that focused on general principles that apply to teaching all mathematics or science. Cohen and Hill (1998) found that mathematics teachers who participated in ongoing curriculum-centered professional development were more likely to report reform-oriented teaching practices in mathematics than teachers who did not participate in such professional development, and that such practices were associated with larger schoolwide gains in students' mathematics performance.

The need for high-quality professional development that focuses on content and how students learn content is all the more pressing in light of the large number of teachers who teach outside of their areas of specialization (National Commission on Teaching and America's Future, 1996). In 1998, 12 percent of science teachers of students in grades 7-12, and 18 percent of mathematics teachers in these grades, had neither a major nor a minor in their main teaching assignment (U.S. Department of Education, 1999a). The severity of this problem varies by state, with some states having very high percentages of teachers teaching outside their areas of specialization (Ingersoll, 1996; U.S. Department of Education, 1999a).[6] This situation is especially true of teachers who teach at-risk students and those who teach in high-poverty schools. In 1998, teachers lacking a major in their primary assignment taught almost a third of the mathematics classes in high-poverty schools, compared to 14 percent of classes in low-poverty schools (U.S. Department of Education, 1999a). Teachers who have not specialized in the subjects that they teach must often teach unfamiliar content. Common sense and research make clear that this is a recipe for disaster.

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[6] While teaching out-of-field is clearly an important issue, most statistics on out-of-field teaching do not consider the *proportion of time* spent teaching out-of-field, and thus may overstate the problem.

The Eisenhower Professional Development Program was designed to help address all of these issues. The program's emphasis is to support professional development designed to help teachers meet the new demands of teaching to high standards. Yet, prior to the 1994 reauthorization, program-funded activities were not generally designed to provide the types of ongoing, in-depth learning opportunities likely to deepen teachers' knowledge and skills, or change classroom practice. The last evaluation of the Eisenhower program, conducted in 1988-89, described it as a "modest investment" that maximizes breadth of coverage across a large number of teachers rather than depth of professional development (Knapp, Zucker, Adelman, & St. John, 1991). That evaluation indicated that district-supported activities, which account for the vast majority of program funds, tended to be one-time in-service training events, averaging six hours in length. In fact, in one quarter of the nation's districts, typical activities lasted less than four hours. Not surprisingly, therefore, the evaluation found few instances of professional development that focused on teachers' content knowledge during nearly 40 site visits to school districts in 1988-89. The pattern of using district Eisenhower funds for short-term professional development activities was recently confirmed by an analysis of program performance reports; in 1994-95, 54 percent of Eisenhower-assisted district activities provided six hours or less of professional development per participant (Donly & Gutmann, 1997). By contrast, Eisenhower activities sponsored by SAHE grantees in 1988-89 typically were more intensive, averaging about 60 hours per participating teacher. These SAHE-sponsored activities also were more likely to focus on mathematics and science content (Knapp et al., 1991). The 1994 reauthorization of the Eisenhower Professional Development Program represents a strong effort to move all program-funded activities toward sustained, intensive, high-quality professional development that supports high academic standards, with a special emphasis on teachers of students in high-poverty schools.

THE EISENHOWER PROGRAM AND THE GOALS OF THE 1994 REAUTHORIZATION

The Eisenhower Professional Development Program was established in 1984, and was reauthorized in 1988 and again in 1994 as Title II of the Elementary and Secondary Education Act, as amended by the Improving America's Schools Act (IASA) of 1994. The Eisenhower Professional Development Program allocates funds through states to school districts and to institutions of higher education and nonprofit organizations. In fiscal year 1999, $335 million was appropriated for Part B of the Eisenhower Professional Development Program, State and Local Activities. Eisenhower funds are distributed to states according to a formula that weights equally the number of children in the state between the ages of 5 and 17 and the state's allocation under Title I, Part A of the Elementary and Secondary Education Act.[7] Eighty-four percent of allocated Title II, Part B funds are distributed to SEAs, with the remaining 16 percent allocated to SAHEs. At least 90 percent of SEA allocations then flow through to local education agencies (LEAs), based on the same formula (equal weights to the school-aged population and the LEA's Title I, Part A allocation).[8] LEAs that receive Eisenhower grants under $10,000 are required to form consortia with other such LEAs, unless the SEA waives the requirement (Section 2204(b)). SAHEs distribute at least 95 percent of their Eisenhower allocations by competitive grants or contracts to institutions of higher education (IHEs) or nonprofit organizations (NPOs) that provide professional development to teachers or prospective teachers. Each SAHE develops priorities and guidelines for the awards based on the state plan for improvement in teaching and learning, which it develops collaboratively with the SEA (Section 2205(a)(2)(A)).

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[7] Part B allocates funds to the 50 states, the District of Columbia, Puerto Rico, the Bureau of Indian Affairs (BIA), and the outlying areas.

Like its predecessor, the Eisenhower Mathematics and Science Education Program, the reauthorized Eisenhower Professional Development Program focuses on the professional development of mathematics and science teachers. The reauthorized legislation, however, expands the program by allowing states and districts to use funds in excess of $250 million to provide professional development to teachers in other core academic subject areas (Section 2206).[9]

In its 1994 reauthorization of the program, Congress made it explicit that Eisenhower-assisted activities should be designed to improve teacher practice and, ultimately, student performance. The law also places particular emphasis on serving teachers in schools with high poverty rates. Furthermore, the reauthorized Eisenhower program embodies policymakers' intention that the program support systemic education reform and deeper learning among teachers. The law incorporates a number of strategies to achieve these goals.

First, and most important, the Eisenhower program is intended to support *high-quality professional development activities*. Before the 1994 reauthorization, Congress provided limited direction about what characterized high-quality professional development; currently, both the Eisenhower Professional Development Program legislation and the program guidance published by the U.S. Department of Education (ED) emphasize that the Eisenhower program should fund professional development that is sustained, intensive, ongoing, and of high quality. Such professional development should reflect recent research on teaching and learning and should provide teachers and other school staff with the knowledge and skills necessary to provide all students with the opportunity to meet challenging standards (Section 2002(2)). Further, these provisions are reflected in ED's performance indicators for the Eisenhower program, which fulfill one of ED's responsibilities under the Government Performance and Results Act (GPRA).[10]

Second, the Eisenhower program is intended to ensure that professional development activities supported with Eisenhower funds include and *target teachers of at-risk students*. Reflecting the strong emphasis on education reform efforts and on federal programs to increase access to a high-quality education for all students, the 1994 legislation requires that state applications and local plans must take into account the educational needs of students from historically underrepresented populations.[11] The Eisenhower legislation also places special emphasis on addressing the needs of teachers in schools receiving Title I, Part A funds; generally these are schools that have higher rates of poverty than other schools in their districts. Teachers in schools that receive Title I support must be involved in the assessment of local needs for professional development, which is required under Title II (Section 2208(b)(2)). Furthermore, in planning for professional development, SEAs and LEAs must take into account how Title II-funded activities address the needs of teachers in schools that receive Title I support (Section 2205(b)(2)(E) and Section 2208(d)(1)(B)). The Title I statute requires similar coordination with the Eisenhower Professional Development Program. See Section 1119(b)(11)(C).

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[8] Up to 5 percent of the SEA's Title II grant may be used for program administration, and another 5 percent may be used to support professional development activities provided at the state level.

[9] There are two ways that Eisenhower funds can be used to support professional development in other subject areas. First, when the appropriation for the program exceeds $250 million, the additional funds can be used to provide professional development in core subject areas other than mathematics and science. Second, the ESEA legislation allows states and districts to apply to the federal government for waivers that allow them to devote larger percentages of their Eisenhower Professional Development Program grants to other core subject areas.

[10] GPRA requires ED to establish annual, quantifiable performance goals and indicators for ED programs as part of a strategic planning process.

Third, the Eisenhower program is intended to integrate Eisenhower-assisted activities with other reform efforts. Recent efforts to improve education have focused on ensuring that all aspects of the education system—including curricula, assessments, teacher education—be consistent with one another and be geared toward the same goals. Reflecting this focus, the law requires the *alignment* of Eisenhower-assisted professional development activities with challenging state and local standards and *coordination* of supported activities with education reform and professional development efforts funded by federal, state, and local governments and other public, private, and nonprofit organizations and associations. Such integration of Eisenhower-assisted activities with other reform efforts would presumably strengthen the quality of those activities by gearing them to challenging standards and by allowing several funding sources to be combined to design higher quality activities. The law's requirements for district planning of professional development activities, for co-funding those activities with funds from other programs, and for IHE/NPOs working with schools, school districts, or consortia of districts, all promote linkages between Eisenhower-assisted activities and those funded from other sources. (See Sections 2205(c), 2208(d)(1)(H), 2209 (a), and 2211(a).)

Finally, the reauthorized Eisenhower program contains provisions intended to foster purposeful planning and ongoing tracking of progress by states and localities, supported by state and district performance indicators. A number of the law's requirements encourage SEAs and LEAs to engage in a *continuous improvement* process, grounded in careful goal-setting and in monitoring progress. The 1994 law establishes detailed requirements for state and local planning under the Title II program. States and localities receiving Title II funds must develop plans to improve teaching and learning. These plans must be based on needs assessments, must be developed through a participatory process, and must describe how the strategy for professional development will meet identified needs (Sections 2205(b)(2), 2208(c)(2), and 2208(d)(1)).[12]

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[11] The legislation requires state applications and local plans to take into account the need for greater access to education in core academic subjects, especially mathematics and science, "by students from historically underrepresented groups, including females, minorities, individuals with limited English proficiency, the economically disadvantaged, and individuals with disabilities, by incorporating pedagogical strategies and techniques which meet such individuals' educational needs" (Section 2205(b)(2)(F)). Similar language is also used to describe how the LEA will use needs assessment to plan professional development activities that address the needs of diverse student populations (Section 2208 (d)(1)(F)).

An important aspect of local planning is the *participation of teachers* in decisions about the use of Eisenhower Professional Development Program funds. The reauthorization legislation specifically states that LEAs

> shall use not less than 80 percent of such [Eisenhower Professional Development Program] funds for professional development of teachers, and, where appropriate, administrators, and, where appropriate, pupil services personnel, parents, and other staff of individual schools in a manner that (A) is determined by such teachers and staff; [and] (B) to the extent practicable, takes place at the individual school site (Section 2210(a)(1)).

This provision reflects the Congress' conclusion that decisions about professional development are best made by its participants. At the same time, the law also states that this professional development should be consistent with the LEA's overall plan for professional development (Section 2210(a)(1)(C)).

Some of the key goals of the Eisenhower program are summarized in a set of performance indicators prepared by ED, as required by the Government Performance and Results Act (GPRA). GPRA requires ED to establish annual, quantifiable performance goals and indicators for ED programs as part of a strategic planning process. The current indicators for Part B of the Eisenhower program reflect the intent of the 1994 legislation (U.S. Department of Education, 1999c):

Objective 1 **Classroom instruction is improved through effective professional development.**

> *Indicator 1.1* **Teachers' skills and classroom instruction**. By 1998, over 50 percent of a sample of teachers will show evidence that participation in Eisenhower-assisted professional development has resulted in an improvement in their knowledge and skills, and by 2000, over 60 percent will show such evidence. By 1999, over 50 percent of a sample of teachers in selected sites will show evidence that participation in Eisenhower-assisted professional development has resulted in an improvement in classroom instruction.

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[12] When applying for Title II funds, states may elect either to submit a program-specific application to ED or to include Title II in an ESEA "consolidated application." If the state submits a Title II-specific application, it must include statutorily required information about the needs assessment it has conducted and its plan to improve teaching and learning. (See, generally, section 14302.) If the state submits a consolidated application, it need not include this information in its application. Similarly, states can require LEAs to submit either a Title II specific or consolidated application. If the state requires a Title II-specific application, it must include statutorily required information about its plan for professional development and its needs assessment. If the state requires a consolidated application, it need not include this information in that application unless the state requires it to do so. Regardless of the content of state- or LEA-consolidated applications, ED has made it clear to states and districts that, if they include the Eisenhower Professional Development Program in consolidated applications, they still must implement all planning requirements that apply to the program. However, information about planning and needs assessments need not be included in the consolidated application itself or otherwise prepared in the formal planning document.

Objective 2 **High-quality professional development and state policy are aligned with high state content and student performance standards.**

Indicator 2.1 **District-level professional development**. By 1998, over 50 percent of teachers participating in district-level or higher education Eisenhower-assisted professional development will participate in activities that are aligned with high standards. By 2000, over 75 percent will.

Objective 3 **Professional development is sustained, intensive, and high quality and has a lasting impact on classroom instruction.**

Indicator 3.1 **High quality.** By 1998, over 50 percent of teachers participating in district-level, Eisenhower-assisted professional development activities will participate in activities reflecting best practices, including a focus on continuous improvement. By 2000, over 75 percent will.

Indicator 3.2 **Sustained professional development.** By 1998, 35 percent of teachers participating in district-level, Eisenhower-assisted activities will participate in activities that are a component of professional development that extends over the school year. By 2000, over 50 percent will.

Objective 4 **High-quality professional development is provided to teachers who work with disadvantaged populations.**

Indicator 4.1 **High-poverty schools.** The proportion of teachers participating in Eisenhower-assisted activities who teach in high-poverty schools will exceed the proportion of the national teacher pool who teach in high-poverty schools.

Indicator 4.2 **Context (not limited to any single program): Teachers.** Teachers in high-poverty schools will participate in intensive, sustained, high-quality professional development at rates comparable to or higher than the rates for teachers in other schools.

Objective 5 **Effective management of the Eisenhower Program at the federal, state, and local levels supports systemic reform.**

Indicator 5.1 **Federal guidance and assistance.** The number of Eisenhower state coordinators who report that ED guidance and assistance are timely and helpful will increase.

Objective 6 **Measurement of integrated planning and collaboration.**

Indicator 6.1 By 1998, 50 percent of all states will have developed performance indicators for integrated professional development across programs (including Eisenhower) in order to support systemic reform and will have data-collection systems in place. By 2000, 75 percent will have these indicators.

Indicator 6.2 By 2000, over 80 percent of states will report that they coordinate and collaborate with Title I State coordinators when they develop their plans for professional development.

This evaluation of the Eisenhower program addresses Objectives 1 through 4. This report is designed to assist policymakers in determining whether and how program-funded activities contribute to the nation's efforts to improve schools, and to lay the foundation for deliberations about the Eisenhower program during the current reauthorization of ESEA. The next section describes the types of information collected in the evaluation in order to provide a comprehensive and accurate picture of the Eisenhower program.

APPROACH TO EVALUATION OF THE EISENHOWER PROGRAM

In February 1997, the U.S. Department of Education's Planning and Evaluation Service commissioned the American Institutes for Research (AIR) to conduct a three-year evaluation of Part B of the Eisenhower Professional Development Program, Title II of the Elementary and Secondary Education Act, as amended by the Improving America's Schools Act (IASA). The evaluation had two purposes:

1. *To describe Eisenhower-assisted activities and evaluate their effects.* The 1994 reauthorization of the program instituted a number of far-reaching changes described above. ED wanted AIR to describe program-funded activities and to obtain an understanding of whether the changes were occurring.

2. *To provide information related to performance indicators that ED developed for the program in response to requirements of the Government Performance and Results Act (GPRA).* GPRA requires ED to determine the program's performance in relation to its goals and objectives.

To meet ED's information needs, the evaluation team designed an integrated set of data collection activities. The evaluation used a multi-method strategy to collect quantitative and qualitative data about Eisenhower-assisted activities. These data come from a variety of sources—state and district officials, directors of grants awarded to institutions of higher education and nonprofit organizations, and teachers. The evaluation was designed to obtain national data about program-funded activities, to obtain a deeper understanding of how the program works in selected locations, and to collect information about how professional development activities affect teacher practice.[13] Exhibit 1.0 displays a timeline of the evaluation's major activities.

As Exhibit 1.0 shows, the evaluation is based on three strands of data collection. The first strand, a *National Profile*, provides information about program goals, strategies, operations, and activities nationwide. During the 1997-98 school year, we conducted telephone interviews with a national probability sample of Eisenhower coordinators in 363 school districts and SAHE-grantee project directors in 92 institutions of higher education or nonprofit organizations (IHE/NPOs).[14] We also collected data from a mail survey of a national probability sample of 1,027 teachers who participated in 657 Eisenhower-assisted activities.[15] These Teacher Activity Survey data describe the types of professional development supported with Eisenhower funds, and compare activities sponsored by school districts to those sponsored by higher education institutions and nonprofits. Appendix A provides additional detail about the sampling design and methodology of the three components of the National Profile

A second strand of data, a set of *Case Studies*, provides detailed information about how the Eisenhower Professional Development Program operates in selected states, school districts, and schools. During the 1997-98 school year, AIR conducted *In-Depth Case Studies* in 10 school districts—two school districts in each of five states: Kentucky, New York, Ohio, Texas, and Washington. The districts were selected to represent a diversity of region, urbanicity, poverty level, and ethnic composition. The sites also were selected because they supported diverse approaches to professional development, instead of, or in addition to, traditional workshops or conference attendance. For example, a number of the in-depth case districts used their Eisenhower funds to provide professional development to "lead" or "resource" teachers who became mentors to other teachers in their schools or districts. Other in-depth case study districts used Eisenhower funds to support workshops or institutes that were unusual because they extended over many days or weeks. Still other districts were selected because they supported school-based professional development activities with Eisenhower funds. Through site visits to the in-depth case study districts, we explored how decisions are made about the use of program funds, and the reasons that the goals, operations, and activities vary across states and districts. The case studies have been a critical source of information about how Eisenhower-assisted activities relate to other professional development and education reform efforts, and about the degree of coherence and consistency among these efforts.

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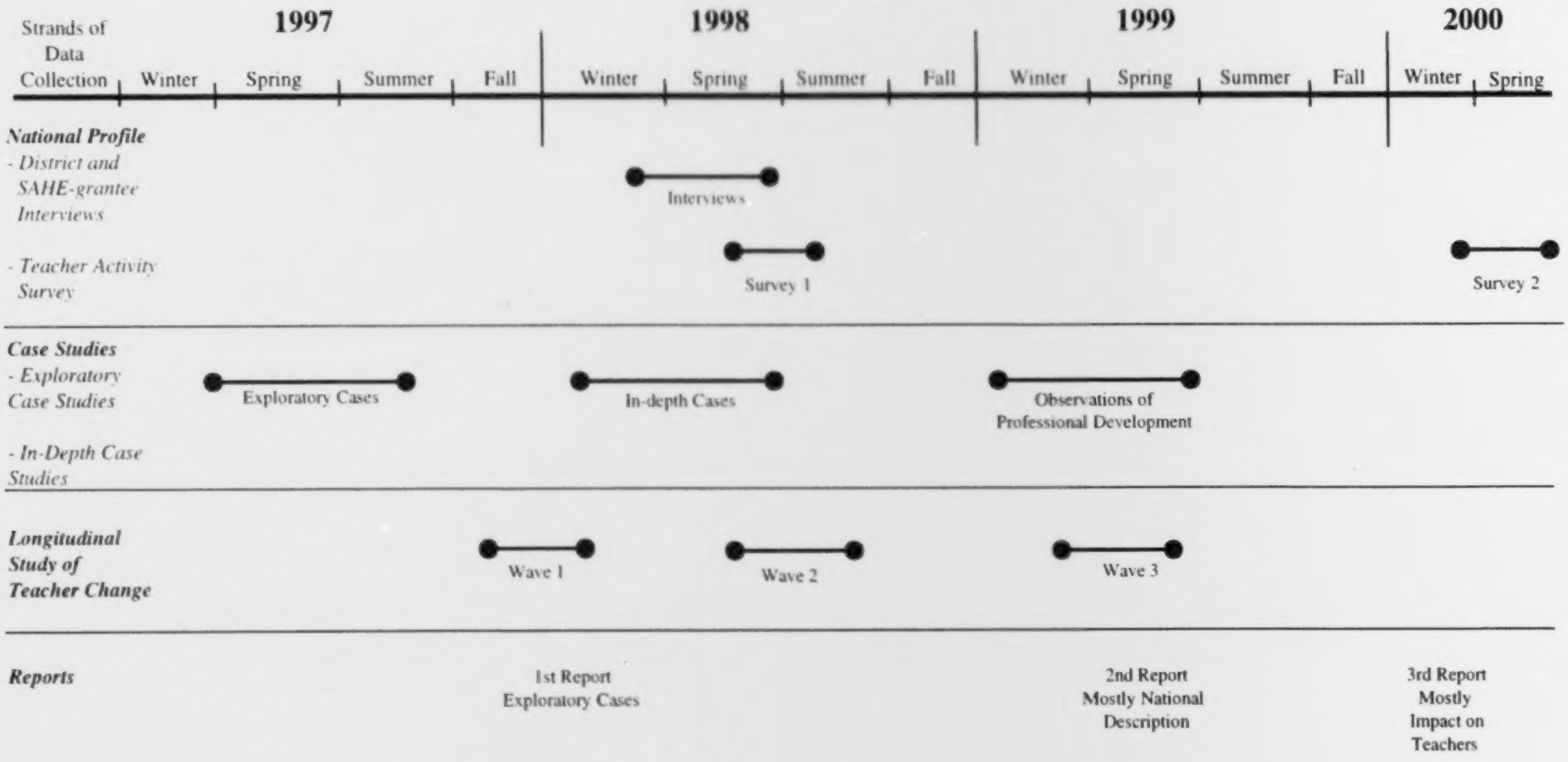
[13] The evaluation was designed to collect data about six research questions: 1) What types of professional development activities does the Eisenhower program make available to teachers, and to what extent do these activities represent best practices? 2) Who participates in Eisenhower-assisted professional development activities? 3) As designed, planned, and implemented at the state, district, and school levels, how does the Eisenhower program fit into the mosaic of professional development and other systemic reform activities? 4) From the teacher's perspective, how do Eisenhower-assisted and other professional development activities combine to provide a coherent, integrated set of learning opportunities? 5) Do teachers' experiences in Eisenhower-assisted professional development activities, in the context of other professional development activities, contribute to teaching practice? and 6) How is the Eisenhower program planned, coordinated, and evaluated at the state, district, and IHE levels? While these research questions guided the evaluation, they do not serve as the framework for reporting findings in this report. Rather, we report analyses from each of our data sets in turn, as depicted in Exhibit 1.3.

[14] The telephone interviews of 363 district coordinators represent a response rate of 88 percent of sampled coordinators; the telephone interviews with IHE/NPO project directors represent a response rate of 87 percent of sampled project directors. Details regarding sampling are described in Appendix A.

[15] The mail survey of teachers represents a response rate of 72 percent of sampled teachers. Details regarding sampling are provided in Appendix A.

EXHIBIT 1.0

Timeline for the Evaluation



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The information from the in-depth case studies expands upon information we obtained from *Exploratory Case Studies* during the 1996-97 school year. Like the in-depth cases, the exploratory case studies, conducted in six school districts, were selected to vary by region, urbanicity, poverty level, and ethnic composition.[16] The first report from this evaluation, the *Eisenhower Professional Development Program: Emerging Themes from Six Districts* (Birman, Reeve, & Sattler, 1998), was based on these exploratory case studies, and we also use information from the exploratory cases in this report. Exhibits 1.1 and 1.2 provide pseudonyms and demographic information about the in-depth and exploratory case studies. More detail about site selection, design, and methodology of the case studies, including their approaches to professional development, is contained in Appendix B.

The third strand of this evaluation, a *Longitudinal Study of Teacher Change*, examines the effects of Eisenhower-assisted and other professional development on teacher practice in mathematics and science. For the in-depth case studies, we interviewed and conducted classroom observations of teachers in three schools—an elementary, middle, and high school—in each of the 10 districts. We also surveyed all teachers who teach mathematics or science in those schools. We asked these teachers detailed questions about the topics they covered, their goals for student performance, and their participation in professional development activities at three points in time: the fall of 1997, the spring of 1998, and the spring of 1999. The three waves of the survey provide data pertaining to the 1996-97, 1997-98, and 1998-99 school years. The Longitudinal Study of Teacher Change will enable us to examine the extent to which teachers' participation in Eisenhower-assisted and other professional development activities improves instruction over time. Appendix C provides additional information about the sampling, design, and methodology of the Longitudinal Study of Teacher Change.

The three strands of the evaluation were designed to produce an integrated portrait of the Eisenhower program. The study does not describe the program simply from the perspective of its administrators, but also from the perspective of the teachers who participate in program-funded activities. The study supplements self-reported information from teachers and administrators with rich contextual information from case studies. Finally, the study does not rely only on teacher reports of changes in their classroom practice, but also is collecting data on teaching practice at three points in time. Thus, because the evaluation involves a variety of research methods and collects data from groups of individuals who view Eisenhower-assisted activities from different vantage points, it is able to provide an accurate description of program-funded activities and analyses of the features of these activities and their effects on teacher practice.

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[16] In addition to being selected for their demographic features, the six exploratory sites also represented districts with features that we believed might influence the program's implementation. The six sites were selected to include: one district that participated in the Eisenhower program through a consortium; at least two districts that had IHE-supported projects working in schools in the district; and two districts located in states that received waivers from ED allowing greater proportions of Eisenhower funds to support professional development in areas outside mathematics and science.

EXHIBIT 1.1

In-Depth Case Studies

DISTRICT PSEUDONYM	CHARACTERISTICS
Richmond	An urban district in New York State, Richmond serves approximately 10,000 students from a predominantly minority population. Nearly 60 percent of the students are African American, and half of the students qualify for a free or reduced-price lunch.
East City	An urban district in New York City, East City serves a largely immigrant population. Between 25 and 30 percent of its children are taught in Spanish, while many of the other children speak Creole, African languages, or French. One hundred percent of the students qualify for a free or reduced-price lunch.
Maple City	A large metropolitan school district in Ohio, Maple City serves nearly 64,000 students. Nearly 55 percent of these students are African American, and 60 percent are eligible for a free or reduced-price lunch.
Buckeye	A suburban school district in Ohio, Buckeye serves approximately 11,000 children. About 90 percent of the students are white. A very small percentage of students qualifies for a free or reduced-price lunch.
Rhinestone	A metropolitan school district in Texas, Rhinestone serves approximately 13,000 students from a predominantly minority population: 43 percent of the students are Hispanic, 35 percent are African American, and 20 percent are white. Fifty-six percent of the students qualify for a free or reduced-price lunch.
Lone Star	In a large city in Texas, Lone Star serves approximately 65,000 students from a predominantly minority population. Seventy-seven percent of students are Hispanic, and 18 percent are non-Hispanic whites. Thirty-two percent of the students have limited English proficiency, and 67 percent of the students qualify for a free or reduced-price lunch.
Riverside	In an urban fringe of a large city in Washington, Riverside serves 20,000 students in a relatively affluent community. Eighty percent of the students are white, and 15 to 20 percent of the students qualify for a free or reduced-price lunch.
Rainforest	A small logging community in Washington, Rainforest serves 1,570 students, 85 percent of whom are white. Ten percent of the students are Native American, and nearly half of the students qualify for a free or reduced-price lunch.
Weller	A poor rural district in Kentucky's Appalachian Mountains, Weller serves 500 students. Ninety-nine percent of the students are white, and 60 percent qualify for a free lunch.
Boonetown	An urban fringe of a mid-sized city in Kentucky, Boonetown serves 8,000 students, 95 percent of whom are white. A very small percentage of students qualifies for a free or reduced-price lunch.

EXHIBIT 1.2

Exploratory Case Districts

DISTRICT PSEUDONYM	CHARACTERISTICS
West City	**A large, urban district on the west coast, West City serves a predominantly minority population of 61,889 students; fewer than 15 percent of students are white, while nearly half are Asian, and another 20 percent are Hispanic. About half of the district's students qualify for a free or reduced-price lunch.**
Middle City	An urban district in the midwest, Middle City serves nearly 100,000 students. Nearly 60 percent of these students are African American, and almost two thirds qualify for a free or reduced-price school lunch.
South City	A large, urban district in the southeast, South City serves predominantly minority students, many of whom are not native English speakers. Nearly half of the district's 333,817 students qualify for a free or reduced-price lunch.
Commuteville	A large, suburban county school district in the mid-Atlantic region, Commuteville serves an ethnically diverse population. Just over two thirds of students are white, with almost equal representation of African American, Hispanic, and Asian students. About 12 percent of the students qualify for a free or reduced-price lunch.
Northtown	Northtown is a small city in New England. Its population is predominantly white (about 80 percent of students), and over a third of students qualify for a free or reduced-price lunch.
Countryplace	Countryplace is a consortium of seven school districts in a rural part of the midwest. The population is fairly homogeneous; virtually all of the 6,000 students served in the consortium are white, and less than 20 percent qualify for a free or reduced-price lunch.

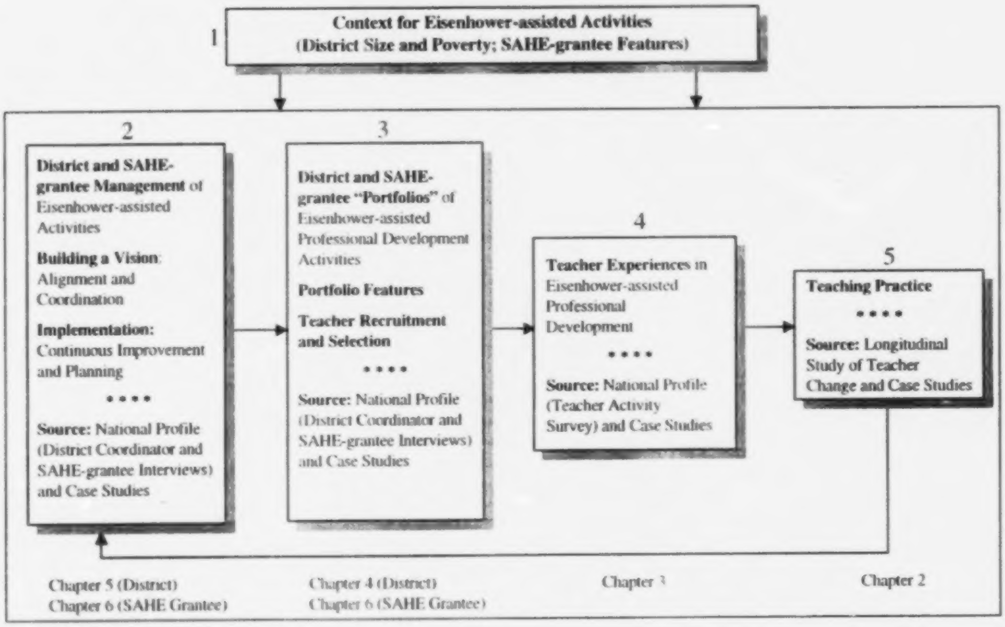
OVERVIEW OF THIS REPORT

This report presents information from all three strands of the evaluation. Exhibit 1.3 displays the logic of the Eisenhower program as it is laid out in the legislation. Improving teaching practice (Box 5) is the goal of the Eisenhower legislation. Teacher experiences in Eisenhower-assisted professional development activities (Box 4) are intended to improve teaching practice. The quality of the activities districts and SAHE grantees make available, and the ways districts and SAHE grantees select teachers to participate (Box 3), in turn influence teacher experiences in Eisenhower-assisted professional development. We hypothesize that the overall quality of Eisenhower-assisted activities is shaped by the degree of integration of the Eisenhower-assisted activities with other professional development and systemic reform efforts, as well as by how districts and SAHE grantees plan and evaluate Eisenhower funded activities (Box 2).

In addition to displaying the logic of the Eisenhower program, Exhibit 1.3 also describes the structure of this report. The report starts by focusing on classroom teaching practice (Box 5), then examines the professional development experiences of teachers, including their Eisenhower-assisted activities (Box 4). The report then describes how the program operates in school districts and in SAHE-supported projects in IHEs and nonprofits (Boxes 3 and 2). Throughout the report, we pay attention to contextual features that affect program-funded activities, such as district size, district poverty level, and the characteristics of SAHE-grantees (Box 1).

EXHIBIT 1.3

Program Logic Model for This Evaluation


1
Context for Eisenhower-assisted Activities
(District Size and Poverty; SAHE-grantee Features)
2
District and SAHE-grantee Management of Eisenhower-assisted Activities
Building a Vision: Alignment and Coordination
Implementation: Continuous Improvement and Planning
* * * *
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
3
District and SAHE-grantee "Portfolios" of Eisenhower-assisted Professional Development Activities
Portfolio Features
Teacher Recruitment and Selection
* * * *
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
4
Teacher Experiences in Eisenhower-assisted Professional Development
* * * *
Source: National Profile (Teacher Activity Survey) and Case Studies
5
Teaching Practice
* * * *
Source: Longitudinal Study of Teacher Change and Case Studies
Chapter 5 (District)
Chapter 6 (SAHE Grantee)
Chapter 4 (District)
Chapter 6 (SAHE Grantee)
Chapter 3
Chapter 2

We begin this report with a description of classroom practice, then describe the characteristics of the professional development activities that teachers participate in, and finally describe the characteristics of Eisenhower-assisted operations. In doing so, we have adopted an approach that is unusual for a federal program evaluation, which usually starts with a description of the "program" and its characteristics. We have chosen this alternative approach because it is important to understand what types of teacher practice the Eisenhower program is attempting to reinforce and to change, and because it allows us to avoid a "top-down" perspective on federal programs. This perspective, common among evaluations of federal programs, implies that federal provisions are at the center of change in teacher practice. Yet, the myriad evaluations of federal education programs over the years illustrate that federal education programs are only one aspect of the many influences upon practice.

Chapter 2 begins with an analysis of teaching practice because the Eisenhower program's goal is to improve instruction, and ultimately student performance. The chapter examines the practice of teachers in the 30 schools that comprise our Longitudinal Study of Teacher Change; the chapter also compares teachers' reports of their classroom teaching to the standards embodied in the National Assessment of Educational Progress (NAEP).

The model on which the Eisenhower program is based assumes that teachers' experiences in Eisenhower-assisted professional development activities will enhance their practice. Therefore, Chapter 3 analyzes the characteristics of Eisenhower-assisted professional development activities using data from the Teacher Activity Survey of our National Profile. In addition, the chapter describes the features of Eisenhower-assisted activities, the characteristics of teachers who participate in them, the coherence of professional development from the teachers' perspectives, and teachers' reports of the impact of professional development on their knowledge and skills and classroom practice. The chapter also compares the characteristics of Eisenhower-assisted activities supported by school districts to those supported by SAHEs. Finally, the chapter identifies several features of effective professional development and explores how the features of professional development relate to one another and to teacher outcomes.

The Eisenhower legislation relies on school districts and SAHE grantees to design professional development activities and to recruit and select teachers for these activities. Because of the important role that school districts play in the Eisenhower legislation, Chapter 4 uses data from district Eisenhower coordinators and data from our in-depth and exploratory case studies to describe district "portfolios" of Eisenhower-assisted activities. A district's portfolio is the collection of Eisenhower-assisted activities offered in a district; the activities in a district's portfolio, taken together, represent the district's strategy for addressing the goals of the Eisenhower legislation. This chapter describes the characteristics of activities supported by Eisenhower funds, and the types of teachers participating in these activities.

The Eisenhower legislation also lays out a variety of procedural requirements that districts must use to administer the Eisenhower program. Chapter 5 examines the ways districts link Eisenhower-funded activities with those funded by other programs, as well as the ways they plan and evaluate supported activities. In particular, the chapter examines how districts build a vision for professional development by aligning Eisenhower-assisted activities with state and district standards and assessments, and by coordinating these activities with other school reform and professional development efforts. The chapter also examines how districts plan and evaluate Eisenhower-assisted activities, including their use of performance indicators.

SAHE grantees confront some issues that parallel those faced by the districts. Like districts, SAHE grantees design professional development activities and recruit teachers to participate in them. However, SAHE grantees in other ways operate quite differently from school districts. SAHE grantees have won competitions within their states to conduct particular activities rather than receiving Eisenhower funds by formula as districts do. In designing the grant and contract competitions, SAHEs develop priorities and guidelines for professional development based on state needs assessments; therefore grantees must design their activities to be responsive to the criteria outlined by the SAHE. Unlike districts, however, SAHE grantees do not have the responsibility to address the professional development needs of all teachers in their jurisdictions. Using data from the National Profile's telephone interviews with SAHE-grantee project directors, Chapter 6 focuses on how SAHE-grantees operate their Eisenhower-assisted projects.

Eisenhower-assisted activities, in both districts and SAHE grantees, do not occur in a vacuum. A district's characteristics, such as size and poverty rate, may affect its approach to professional development activities. For example, large districts have more access to other funding sources for professional development than smaller districts and, therefore, may be more likely to coordinate their Eisenhower-assisted activities with those of other programs. Districts with high rates of poverty might be more likely to target teachers of at-risk students. SAHE grantees also differ from one another in a number of ways that may affect the characteristics of the Eisenhower-assisted activities that they support. For example, SAHE-grantee project directors from university education departments are likely to have different areas of expertise from those in mathematics departments, and project directors in research universities might have access to different types of resources than those in other types of institutions. Box 1 of Exhibit 1.3

represents the contextual features of school districts and SAHE grantees that may affect how program-funded activities operate. Throughout this report, we examine these contextual features and their possible effects on districts, institutions of higher education, and nonprofits.

The organization of this report allows the reader first to learn about teachers' practices in the classroom, then the Eisenhower-assisted professional development activities that are designed to affect their practices, and finally, district and SAHE-grantee management and operation of these activities. In this way, we hope that our analysis and discussion of Eisenhower-assisted activities and the operation of those activities will be grounded in a knowledge and understanding of the teacher classroom practices that the Eisenhower program is designed to improve.

CHAPTER 2

TEACHING PRACTICES IN MATHEMATICS AND SCIENCE

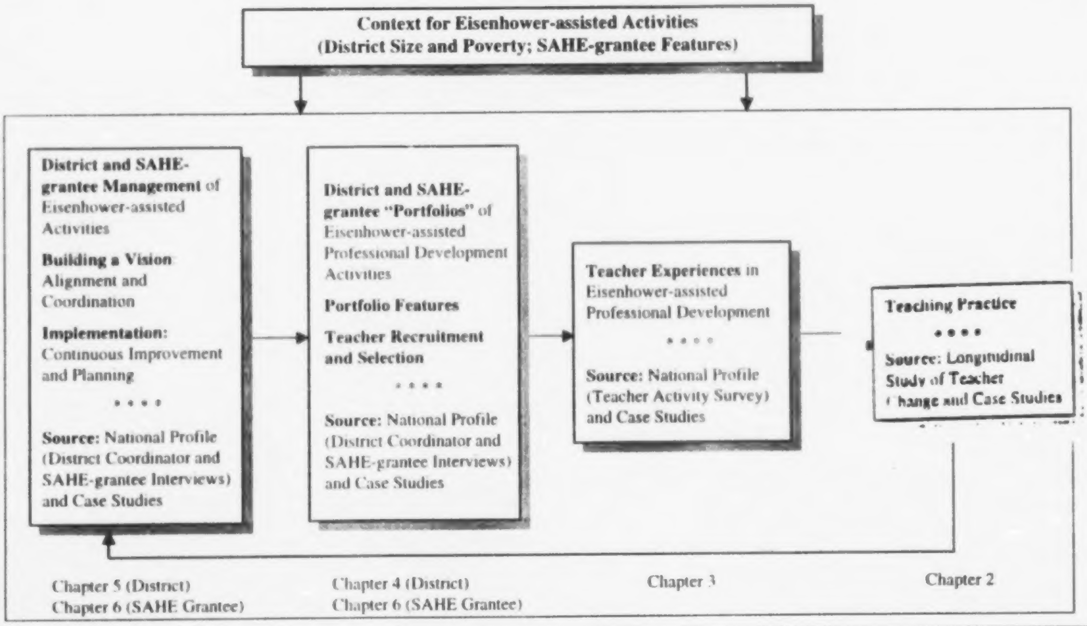
The primary goal of the Eisenhower Professional Development Program is to support professional development experiences for teachers that will enhance classroom teaching and, ultimately, improve student learning. Because improved teaching is critical to improved learning for students, it is a cornerstone of the standards movement. Therefore, this report begins by focusing on classroom teaching practice.

The purpose of this chapter is to lay a foundation for our evaluation of the Eisenhower program, by reviewing the current literature on teaching and learning in mathematics and science and by describing classroom teaching practices in the 30 in-depth case study schools. By drawing on the literature and data on the 30 case schools, we will characterize the strengths and weaknesses of current teaching practices in mathematics and science and identify areas in which further professional development should focus.

The data on classroom practice that we will report come from two sources: the baseline year of our three-year longitudinal survey of teacher change and classroom observations. In a subsequent report, we will use the second and third waves of the longitudinal survey, along with the data reported here, to examine the effects of participation in professional development on changes over time in teaching practice. The data we report in this chapter are thus the first step in our examination of the effect of Eisenhower-assisted activities on teaching practice. Exhibit 2.0 shows how the material covered in this chapter fits into the entire framework of the evaluation.

EXHIBIT 2.0

Conceptual Framework for This Evaluation


Context for Eisenhower-assisted Activities
(District Size and Poverty; SAHE-grantee Features)
District and SAHE-grantee Management of Eisenhower-assisted Activities
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Alignment and Coordination
Implementation:
Continuous Improvement and Planning
• • • •
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
District and SAHE-grantee "Portfolios" of Eisenhower-assisted Professional Development Activities
Portfolio Features
Teacher Recruitment and Selection
• • • •
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
Teacher Experiences in Eisenhower-assisted Professional Development
• • • •
Source: National Profile (Teacher Activity Survey) and Case Studies
Teaching Practice
• • • •
Source: Longitudinal Study of Teacher Change and Case Studies
Chapter 5 (District)
Chapter 6 (SAHE Grantee)
Chapter 4 (District)
Chapter 6 (SAHE Grantee)
Chapter 3
Chapter 2

Data Sources

This chapter draws on two sources of data collected for the Longitudinal Study of Teacher Change: 1) a baseline survey of teachers in 30 schools and 2) observations of classes for a sample of teachers (two per school) who completed the surveys.[1] In addition, we conducted a content analysis of the National Assessment of Educational Progress, in order to compare the content of instruction that teachers reported in the survey to a national standards for content. In the paragraphs below, we describe each of these sources in turn.

Baseline Wave of the Longitudinal Teacher Survey

To gather data on teachers' classroom teaching practices, we surveyed all teachers who teach mathematics or science in the 30 schools—one elementary, one middle, and one high school in each of the 10 in-depth case study districts. The baseline wave of the survey, which was conducted in the fall of 1997, asked teachers to describe their teaching during the 1996-97 year.[2] In the survey, we asked teachers to select a year-long mathematics or science course to describe. We asked them to choose, if possible, a course they had taught in 1996-97, were continuing to teach in 1997-98, and expected to teach in 1998-99.

The survey contained two main sections concerning teaching practices in the selected course, one on the content taught and one on pedagogy. We discuss these two sections further when we present our results, in subsequent sections of the chapter.

Of the 575 teachers surveyed in the 30 in-depth case schools, 436 teachers (76 percent) responded.[3] Some teachers who responded did not teach mathematics or science during the 1996-97 school year, either because they were not employed as teachers in 1996-97 or because they taught other subjects, and thus they are not included in the analyses of classroom teaching. In addition, we excluded some teachers from particular analyses because they did not complete all of the required items. The sample is 74 percent female and 18 percent minority. Six percent of the teachers in the sample are novice teachers, or teachers who have taught the surveyed subject for two or fewer years. (See Appendix C for a more complete description of the sample and response rates.)

Several features of the sample should be considered in interpreting our results. First, by design, the sample of 30 schools is disproportionately high poverty (50 percent of the sample schools are high poverty, compared to the national average of 25 percent). This feature of the sample is useful in an evaluation of the Eisenhower program, because the program targets teachers in high-poverty schools. Throughout the analyses, we tested whether differences between teachers in high- and low-poverty schools are statistically significant (at the .05 level); we note these findings only when they are significant. Second, we selected the districts and schools in the sample because they had adopted diverse approaches to professional development, in addition to traditional workshops and conferences. If such professional development is more effective than traditional approaches, then the teachers' instruction in the sample schools might be better than that of the average teacher. Finally, the Longitudinal Study of Teacher Change focuses on mathematics and science teachers because they are the primary participants in Eisenhower-assisted activities. For all of these reasons, the sample is not nationally representative, but neither is it extremely unusual.

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[1] The other source of teacher-level data collected as part of this evaluation is the teacher activity survey discussed in Chapter 3. In the activity survey, teachers are asked to describe how professional development has changed their instruction. The Longitudinal Study of Teacher Change, on the other hand, will analyze changes in instruction over time to determine the impact of professional development on instruction. Because Longitudinal Study teachers are not judging the impact of professional development themselves, the study minimizes self-report bias.

[2] The remaining two waves ask teachers to describe their teaching in the 1997-98 and 1998-99 years.

[3] The response rate of high school teachers was higher than those of elementary and middle school teachers, in part because principals and department chairs in high school were more involved in administering the survey.

Classroom Observations

As part of our site visits to the 30 in-depth case study schools, we conducted one-time classroom observations of two teachers in each school—usually one mathematics teacher and one science teacher. In conjunction with the observations, we conducted a brief pre-observation interview and a somewhat longer post-observation interview with each of the 60 teachers we observed. The teachers we observed were selected by the principals of the schools we visited, in part based on their availability at the time of our visit and willingness to be observed; participation in professional development was not a factor in selecting teachers to observe. Thus, the teachers we observed are not necessarily representative of all teachers in the study schools.

We conducted the observations using a structured protocol, designed in part to parallel our teacher survey instrument. Prior to conducting the observations, we conducted a training session in which our site visitors observed videotaped lessons and coded them using our observation protocol. This allowed the site visitors to develop a common understanding of the protocol and to check inter-rater reliability.

National Assessment of Educational Progress (NAEP)

To report on the consistency of the content taught with high standards, we needed to identify an appropriate measure of high standards. The National Council of Teachers of Mathematics (NCTM) and National Research Council (NRC) standards set a framework for important mathematics and science concepts that should be taught in the classroom. However, these standards are at a level of generality that makes quantitive content analysis difficult; therefore, we look to the National Assessment of Educational Progress (NAEP) to make explicit the content focus of the standards. The NAEP provides items that reflect this framework and permit content analyses items to determine relative emphases for mathematics and science content. In order to develop a test that would be perceived as national, the National Center for Education Statistics has modeled the NAEP on the professional associations' standards (Reese et al., 1997). For example, 30 percent of the science assessment involves hands-on performance exercises and 50 percent involves open-ended questions (NAGB, 1997); these also are areas of emphasis for the standards. The high standards set by the test are evident in the scores reported for the 1996 science assessment; only three percent of students tested at the advanced level and 21 to 29 percent tested at or above the proficient level (Raizen, 1998). As "the nation's report card," the NAEP represents an appropriate standard, although admittedly not the only possible standard. Because the NAEP focuses on content and performance goals consistent with standards developed by national professional associations, and because the

NAEP establishes high expectations for achievement, it is reasonable to use the items on the NAEP tests as a measure of high instructional standards.[4,5]

Organization of Chapter

The rest of the chapter is organized in four sections. The first section reviews current standards and literature on effective content and pedagogy. The second section describes the content of instruction in the 30 in-depth schools, drawing on data from the baseline wave of the longitudinal survey and the classroom observations. The third section focuses on pedagogy in the 30 schools. Finally, in a brief concluding section, we draw together the implications of our analysis of teaching in the 30 schools.

EFFECTIVE CONTENT AND PEDAGOGY

An understanding of good mathematics and science instruction begins with a vision for the classroom. This is a difficult vision to capture for two reasons. First, effective learning experiences differ; there is no single model of an ideal class. Second, educators and researchers do not know all there is to know about ideal instructional strategies. However, research has identified some common elements of "good instruction" in mathematics and science. In particular, certain elements of content and pedagogy improve student learning.

Overall, effective instruction can be characterized by *content* that is aligned with high standards and *pedagogy* focused on active learning. Content includes both the topics of instruction, such as fractions, and the teacher's expectations for student performance, such as memorizing or understanding concepts. Pedagogy refers to the types of activities used in instruction and typically includes dimensions such as whole class versus individual instruction or project versus text-based instruction.

Content

Content coverage matters for student learning. Student achievement improves when the content of instruction is consistent with national standards and assessments (Cohen & Hill, 1998; Gamoran et al., 1997). National standards for mathematics and science specify critical content areas that effective instruction should address: covering core topics, such as life science, and developing students' topic understanding in sophisticated ways, such as making connections to real-world situations.

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[4] However, some performance goals for students—such as carrying out sustained work—cannot be adequately measured by a timed, paper-and-pencil test such as the NAEP.

[5] Mathematics and science generally are tested in every other NAEP administration, or every four years. The data used for these analyses were the 1996 mathematics and science NAEP tests. See Appendix D for a description of the NAEP content analysis.

The National Council of Teachers of Mathematics (NCTM) developed standards for mathematics curricula (NCTM, 1989) and instruction (NCTM, 1991).[6] The key content areas differ by school level (i.e., K-4, 5-8, 9-12), but generally focus on the following:

- Numbers and operations: understanding and representing numbers and relationships, understanding operations, and using computational tools and strategies.
- Patterns and functions: understanding types of patterns and relationships, using symbolic forms, and using models.
- Algebra: understanding basic concepts (e.g., variable, expression); representing situations with tables, graphs, rules, and equations; analyzing tables and graphs; solving linear equations; investigating inequalities; and applying algebraic methods to solve real-world problems.
- Geometry and spatial sense: analyzing two- and three-dimensional objects, using different representational systems, recognizing the usefulness of transformations, and using visualization and spatial reasoning.
- Measurement: understanding attributes, units, and systems of measurement, and applying a variety of techniques, tools, and formulas.
- Statistics and probability: posing questions and using data to answer them, interpreting data, developing and evaluating inferences, and understanding and using notions of chance.

The mathematics standards also identify standards for student performance that apply across all grades:

- Problem solving: building new knowledge through work with problems, developing a tendency to use problem-solving skills within and outside mathematics, using and adapting varied strategies to solve problems, and reflecting on mathematical thinking.
- Reasoning: recognizing reasoning and proof as important, making and investigating mathematical conjectures, developing and evaluating mathematical arguments, and using various types of reasoning.
- Making connections: connecting different mathematical ideas, understanding how ideas build to form a coherent whole, and using mathematics in non-mathematical contexts.
- Communicating: organizing mathematical thinking to communicate with others, expressing mathematical ideas coherently, considering the thinking of others, and using the language of mathematics.

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[6] A draft of the revised 1989 standards was released in 1998. Major changes include: 1) reorganizing the grade-level breakdown from K-4, 5-8, and 9-12 to preK-2, 3-5, 6-8, and 9-12; 2) relating process standards—expectations for student performance—more closely to content standards; 3) adding the process standards of representation; and 4) emphasizing the development of content strands (e.g., algebra) over the grade levels (Romberg, 1998).

Reform in science education has emphasized real-world problems, investigations of natural phenomena, and linkages to other subjects rather than abstract knowledge (Raizen, 1998). In setting content standards for science, the National Research Council (NRC) identified certain content areas as central to teaching and learning science:[7]

- Physical, life, earth and space science: knowing, understanding, and using knowledge of matter, motion and forces, energy, atoms, chemical reactions, organisms, cells, evolution, behavior, earth systems, and the universe.
- Science and technology: developing abilities of technological design and understanding about science and technology.
- Science in personal and social perspectives: understanding and making decisions on personal and community health, populations, resources, the environment, and science in society.
- History and nature of science: understanding the nature of science from a historic perspective.

In addition, NRC identified some concepts and student performance standards that cross content areas, such as systems, order, and organization; evolution and equilibrium; and understanding of and ability to conduct scientific inquiry.

In setting standards for student performance, the NRC emphasized developing skills to do scientific inquiry, such as asking questions, collecting data, and developing explanations. An underlying premise of these standards is to focus less on "student acquisition of information" and more on "student understanding and use of scientific knowledge, ideas, and inquiry processes" (NRC, 1996: p. 52). Thus, the performance goal of memorizing material is less central than the goals of understanding concepts or making connections.

As the standards imply, the organization of the curriculum within the school also affects students' learning experiences. Past research has suggested that there is too much redundancy in content from one grade level to the next, at least for kindergarten through eighth grade. Compared to other countries, the curriculum in the U.S. covers more topics; each year the curriculum expands to incorporate new topics but, unlike the practice in other countries, topics are not phased out of the curriculum in successive grades (Schmidt, McNight, and Raizen, 1997). Effective instruction entails organizing the curriculum so that learning at each grade builds on prior learning, developing deeper and more complex understandings.

Pedagogy

Pedagogy- –or the way content is presented—also matters for student learning. National mathematics and science standards emphasize the pedagogical approach of active instruction. For example, the science standards advocate inquiry-based learning, in which the teacher facilitates rather than informs (NRC, 1996). The mathematics standards stress instruction that builds on students' experience, in which students are actively engaged in wrestling with complex problems (NCTM, 1998).

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[7] The National Science Teachers Association (NSTA), the American Association for the Advancement of Science (AAAS), and NRC each developed standards documents (see AAAS, 1993; AAAS, 1989; NSTA, 1992). The three organizations agreed that NRC would be responsible for developing broad standards for science, so the NRC standards are the primary focus here (Raizen, 1998).

The standards are based on research that indicates that active learning is especially effective. Students learn science best when they are active participants, engaged in activities, rather than passive recipients of lecture-style instruction (Raizen, 1998). Active learning calls for students to be involved in creating their own learning experiences. Pedagogical approaches that support active mathematics and science learning include using inquiry-based instruction, in which the teacher facilitates rather than informs, actively engaging students in complex problems for which there are no simple solutions, and incorporating multiple disciplines in activities (NCTM, 1998; NRC, 1996; Raizen, 1998).

National standards in mathematics and science, consistent with research on effective instruction, indicate that both content—especially core topics and complex performance goals—and pedagogy—especially active learning—are important to student learning. Clearly, content and pedagogy are interrelated. While active learning is especially student-driven, it is still coordinated around content—effective teachers set instructional goals and monitor activities, intervening when appropriate. Thus, while we examine content and pedagogy in turn in this chapter, the two together contribute to effective instruction.

CONTENT COVERAGE AND HIGH STANDARDS

Section Findings

- *Teachers tend to give more emphasis to low-level topics (e.g., number sense, calculation) than do items on the National Assessment of Educational Progress (NAEP) and less emphasis to topics such as geometry; further, there is much redundancy in topics covered from grade to grade.*

- *Teachers report balancing their emphases across all six goals for student performance, while the NAEP focuses more on some of the concrete performance goals. Although this suggests that teachers are emphasizing more abstract performance goals, such as understanding concepts rather than memorizing, our observations suggest that these performance goals are not as deep as teachers report them to be.*

- *Teachers cover content areas in greater breadth and less depth than the content assessed by the NAEP, especially in high-poverty schools.*

- *Mathematics instruction is more highly aligned with items on the NAEP than is science instruction, and elementary and middle school instruction are more highly aligned than is high school instruction.*

In this section, we examine whether the content covered by teachers in our sample emphasizes high standards. We begin our discussion by describing our data on the content taught and the approach we have taken to determine the degree to which the content reflects high standards. Then, we turn to our results.

Content and Alignment with Standards

To assess the consistency of the content taught with national standards, we have collected unusually fine-grained information on the content covered by our sample of teachers, and we have developed a unique strategy of measuring alignment, drawing on the full set of items administered as part of the National Assessment of Educational Progress. In the following sections, we provide a brief overview of these methods. (See Appendix C for more detail.)

Measuring the Content Taught

Our main data on content come from the baseline wave of the longitudinal survey of teacher change. We characterize the content taught in terms of two major dimensions: the *topics* covered and the *performance goals* teachers hold for students.

In the content section of the survey, we asked teachers to describe the content they taught in the class they chose to describe, using a two-dimensional matrix. (Different forms of the matrix were used for elementary, middle, and high school mathematics and science. See Exhibit 2.1 for a sample section from the elementary mathematics form of the survey.) The matrix was initially developed by Porter et al. (1993) in a comprehensive study of mathematics reform and was revised for purposes of the Eisenhower evaluation. Since then, the matrix has been used in several other studies, including Gamoran et al. (1997).[8]

The rows of the matrix contain a comprehensive list of the topics and subtopics teachers might cover. Algebra, for example, is a topic in mathematics, and multi-step equations is a subtopic under algebra. Astronomy is a topic within science, and the Earth's moon is a subtopic under astronomy. Each subject area (i.e., mathematics and science) and each school level (i.e., elementary, middle, and high school) has a unique set of topics and subtopics. The matrix for middle school mathematics, for example, has nine topics and 84 subtopics, while the matrix for high school science has 28 topics and 191 subtopics.

The columns of the matrix contain performance goals for students. Performance goals are teachers' expectations for what students should be able to do. There are six performance goals in the matrix: 1) memorize; 2) understand concepts; 3) perform procedures; 4) generate hypotheses; 5) collect, analyze, and interpret data; and 6) make connections. (See Exhibit 2.2 for definitions of the performance goals.) For example, when a teacher emphasizes memorizing, the teacher may expect students to be able to produce definitions or terms, facts, and formulas from memory. When a teacher emphasizes using information to make connections, the teacher may expect students to be able to use and integrate concepts, apply ideas to real-world situations, build or revise theory, and make generalizations.

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[8] Porter et al. (1993) present comprehensive information on the reliability and validity of data collected using the content matrix, as well as using teacher logs and classroom observations.

EXHIBIT 2.1

Excerpt from Content Coverage Section of the Elementary School Mathematics Teachers Survey

Elementary School Topics	*Coverage*	*Your Performance Goals for Students*					
Whole Numbers	<none>	**Memorize**	**Understand Concepts**	**Perform Procedures**	**Generate Hypotheses**	**Collect Analyze/ Interpret**	**Make Connections**
Addition	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3
Subtraction	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3
Multiplication	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3
Division	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3
Combinations of add, subtract, multiply, and divide	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3
Equations (including missing addend, factor, etc.)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3
Fractions	<none>	**Memorize**	**Understand Concepts**	**Perform Procedures**	**Generate Hypotheses**	**Collect Analyze/ Interpret**	**Make Connections**
Identify equivalent fractions	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3
Add	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3
Subtract	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3
Multiply	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3
Divide	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3
Combinations of add, subtract, multiply, and divide	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3

Source: Longitudinal Teacher Survey Elementary School Mathematics, Fall 1997 (1996-97 school year).
How to read this exhibit: The rows represent topics (in bold typeface) and their corresponding subtopics. The teachers were asked to complete the grid by 1) indicating whether the topic had not been covered during the school year by circling "none"; 2) noting the level of coverage for each subtopic by circling 0, 1, 2, or 3 to indicate not covered to sustained coverage; and 3) marking the emphasis for each subtopic on each of the performance goals by circling 0, 1, 2, or 3 to indicate no emphasis to sustained emphasis.

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EXHIBIT 2.2

Performance Goals for Students

The following are various performance goals that teachers hold for their students. Refer to this list in describing your performance goals for each topic covered as part of instruction.

Memorize
- Definitions/Terms
- Facts
- Formulas

Understand Concepts
- Explain concepts
- Explain procedures/methods of science & inquiry
- Develop schema, or frameworks of understanding
- Represent concepts with manipulatives or models

Perform Procedures
- Use numbers
- Do computation, execute procedures or algorithms
- Replicate (illustrative or verification) experiments
- Follow procedures/instructions

Generate Questions/Hypotheses
- Brainstorm
- Design experiments
- Solve novel/non-routine problems

Collect, Analyze & Interpret Data
- Make observations
- Take measurements
- Classify/order/compare data
- Analyze data, recognize patterns
- Infer from data, predict
- Explain findings, results
- Organize & display data in tables, graphs or charts

Use Information to Make Connections
- Use & integrate concepts
- Apply to real-world situations
- Build/revise theory
- Make generalizations

***Source*:** Longitudinal Teacher Survey, Instruction booklet for section II.
How to read this exhibit: This exhibit illustrates the instructions given survey respondents for completing the matrix displayed in Exhibit 2.1.

A *content area* can be defined as the intersection of the two dimensions, topics and performance goals. For example, if teachers emphasize memorizing facts about the Earth's moon, the content area incorporates the subtopic (the Earth's moon) and the performance goal (memorizing). Both elements—topics and performance goals—are integral to understanding the content of a lesson or course. For example, the student learning that would be likely to take place if the content were memorizing facts about the Earth's moon (e.g., gravity, distance from the Earth) is very different from the student learning that would occur if the content were understanding the Earth's moon (e.g., forces working to keep satellites in orbit).

Each teacher was asked to follow several steps in describing the teacher's year-long course using the matrix. First, the teacher indicated the amount of time given to each subtopic, using a scale from 0=no time through 3=more than two lessons or class periods. Then, the teacher indicated the relative amount of emphasis given to each performance goal when teaching the subtopic, using a scale from 0=no emphasis to 3=sustained emphasis. We used the full matrix of data provided by each teacher to calculate the percentage of the teacher's total year-long class time devoted to each topic and subtopic, each performance goal, and each content area (intersection of a subtopic and performance goal).

Assessing the Consistency with High Standards

We compare teachers' instruction to the NAEP items in order to assess how well instruction meets high standards. To determine the relative amount of emphasis given by the NAEP to each subtopic, performance goal, and content area in our elementary, middle, and high school science and mathematics matrices, we reviewed the full set of NAEP mathematics and science items for the 1996 tests for fourth, eighth, and twelfth grade.[9] We asked two curriculum experts in mathematics and two experts in science to review each NAEP item and to determine the specific subtopics and performance goals each item was designed to tap.[10] Using this information for the full set of NAEP items, we computed the relative emphasis given by NAEP to each subtopic, performance goal, and content area.

In the paragraphs that follow, we draw on our data provided by teachers, as well as our information from the NAEP, to examine four aspects of the content taught. First, we examine the extent to which the topics covered by the teachers in our sample match the topics assessed by the NAEP. Then, we consider the extent to which the performance goals our teachers emphasize match the NAEP. Third, we examine the content areas (intersection of topics and performance goals). Finally, we develop an overall index of the alignment between the content covered by teachers and the content assessed by the NAEP.

Topic Emphases and High Standards

In this section, we examine the emphasis given by teachers in our sample to specific topics, and we compare this with the relative emphasis given to the same topics in the NAEP. Research indicates that some topics, for example geometry and measurement in mathematics, are special weaknesses for students in the United States (Beaton et al., 1996). In the Third International Mathematics and Science Study, U.S. students in seventh grade scored 19th out of 27 countries in geometry and 23rd in measurement. U.S. students in eighth grade scored 21st out of 25 countries in geometry and 23rd in measurement (Beaton et al., 1996). Thus, in interpreting our results, we give special attention to these two topics.

Exhibit 2.3 presents our data on the emphasis given to particular topic areas, for the middle school mathematics teachers in our sample. (Similar results for the other teachers in our sample are included in Appendix D.) The results indicate that topics that traditionally have been weaknesses for U.S. students, especially for mathematics, do not receive much attention from teachers in our sample. Despite evidence that middle school students need to focus on measurement and geometry, middle school teachers surveyed for this study taught measurement on average for 12 percent of their course, compared to the NAEP's emphasis of 20 percent. The average middle school teacher taught geometry for nine percent of their course, compared to the NAEP's emphasis of 15 percent. On the other hand, middle school teachers tend to give more emphasis to low-level topics than does the NAEP. For example, middle school teachers emphasized number sense 37 percent of the time compared to 14 percent for the eighth-grade NAEP.[11]

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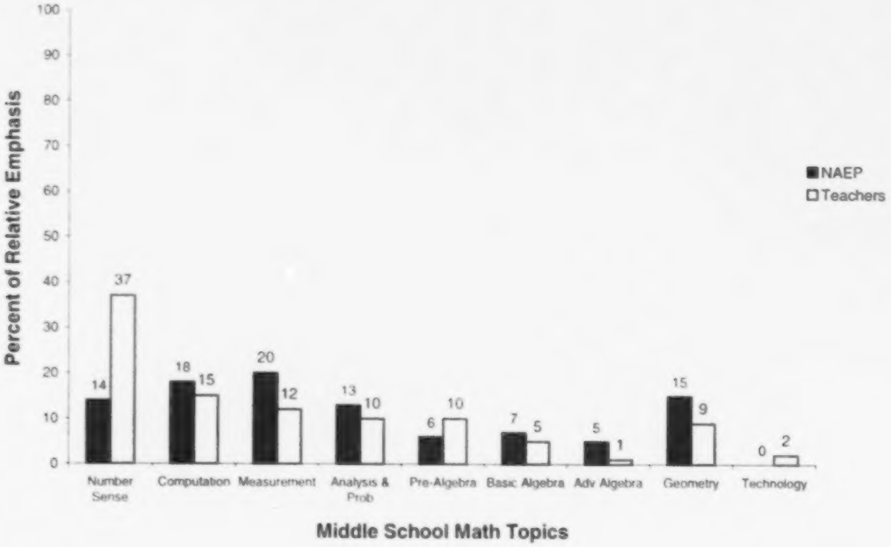
[9] The NAEP fourth-grade test was compared to instruction for teachers in elementary school (grades K-5). The NAEP eighth-grade test was compared to instruction for teachers in middle school (grades 6-8). The NAEP twelfth-grade test was compared to instruction for teachers in high schools (grades 9-12).

[10] Appendix D provides information on the reliability of the expert ratings of the NAEP items.

[11] Results shown in Appendix D indicate that the emphasis on geometry is lower in high-poverty schools than in low-poverty schools.

EXHIBIT 2.3

Percentage of Emphasis on Topics in Middle School Math, Reported by NAEP and by Teachers in the Longitudinal Teacher Survey (n=38)



Source: Longitudinal Teacher Survey, Fall 1997 (1996-97 school year)
How to read this exhibit: The first bar shows that NAEP has a relative emphasis of 14 percent on the topic Number Sense for middle school math, and the second bar shows that middle school math teachers in our sample indicate a relative emphasis of 37 percent on the topic Number Sense. Each of the topic areas for middle school math is included in the bar chart. The relative emphasis can be between 0 and 100 percent.

Questions about the topic focus for instruction can be extended from whether teachers cover critical topics to whether they cover any topics. Previous research has found that teachers sometimes focus so much on changing the process of instruction that they neglect the topics of the lesson. Roitman (1998), for example, described a case in which an observed teacher was so focused on active learning activities that her lesson was topic-free. To consider this possibility, using the Eisenhower data, we turn to the classroom observations.[12] Several of the observed lessons did focus on process to the point of having little or no content emphasis. For example, in a sixth-grade science lesson in Boonetown, the class focused on using the scientific method. Students conducted an experiment to test the absorption of different brands of paper towels, as part of a consumer unit. In preparation for the experiment, student groups had written hypotheses and experimental designs the day before. The teacher introduced the class, reviewed relevant vocabulary, and directed the students to work in groups. The groups designed and conducted their own experiments. At the end of the lesson, the teacher asked students to consider ways in which the experiment could be improved. However, students did not discuss or present their findings. While the lesson could have developed understanding of material composition or properties, the focus throughout was on process rather than content.

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[12] The surveys, which required teachers to report content foci, cannot be used to answer this question. If the teacher did not report on content, the survey was considered incomplete, and the data were not used.

The United States differs from other countries in how the content is organized across grades. In the U.S., topics are repeated in many grades, theoretically with increasingly complex subtopics. Other countries, such as France and Japan, focus on selected topics at each grade level (Matheson et al., 1996). For example, the eighth-grade mathematics teachers in Japan focus on four topics, with relatively little emphasis (less than four percent of instructional time) on other topics. In contrast, U.S. teachers spread instruction over 21 topics (Wilson and Blank, 1999).

According to national standards for science and mathematics, developed by the National Research Council (NRC) and the National Council of Teachers of Mathematics (NCTM), it is possible to cover the same broad topics across grades, while enhancing the depth of exposure. Revisiting topics in successive grades should build on understanding, allowing instruction to focus on more complex subtopics within broad topics.

The NRC science content standards cover the same broad topics (i.e., physical, life, earth and space science, science and technology, science in personal and social perspectives, and history and nature of science) at all grade levels. These standards stress developing a more sophisticated understanding of more advanced subtopics within each topic as students move up grade levels, to reflect developmental and learning abilities of students. With this approach, the subtopics become more abstract and students are expected to develop greater conceptual understanding as they progress through the grades. Thus, NRC's science standards suggest that, at a gross level, there should be substantial overlap in topics across grade levels; however, students at each school level should be learning different subtopics within these broad topics.

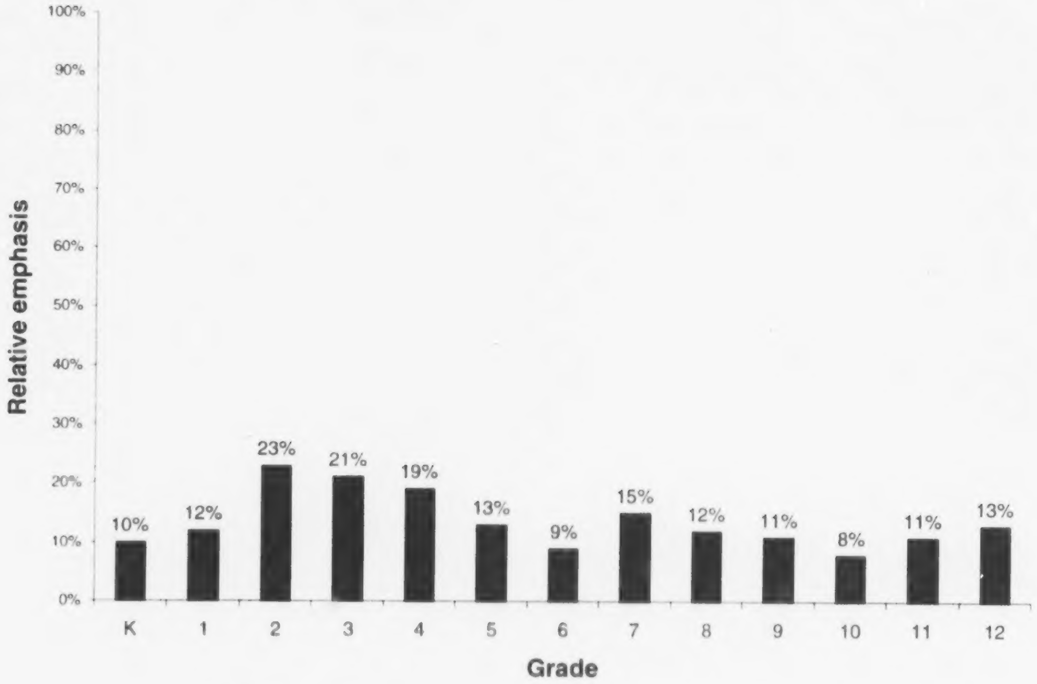
Similar to the science standards, the NCTM standards emphasize five major topics (i.e., number and operations; patterns, functions, and algebra; geometry and spatial sense; measurement; and data analysis, statistics, and probability) in every grade. Again, like the science standards, the mathematics standards stress that specific subtopics within broad topics become more sophisticated as the student progresses through the grades.

Consistent with the international research, our data show that, on average, teachers across grades generally teach the same topics. There is little clear pattern of intensified coverage in broad topic areas as grade levels increase. For example, teachers at all grade levels teach measurement in mathematics, some grades more than others, but there is no pattern of consistent increase or decrease in focus on measurement as grade levels increase (see Exhibit 2.4). First-grade mathematics teachers emphasized measurement for 12 percent of the time, second-grade teachers for 23 percent, sixth-grade for 9 percent, and twelfth-grade for 13 percent.

Furthermore, the measurement subtopics emphasized do not consistently increase in complexity as the grade level increases (see Exhibit 2.5). Of the 16 measurement subtopics, only four show the expected pattern. Two of the more low-level subtopics (i.e., use of instruments and time and temperature) showed, on average, decreased emphasis as grade level increased (from 34 percent to nine percent and from 23 percent to one percent, respectively). Two of the more complex topics (i.e., Pythagorean theory and trigonometry) showed, on average, increased emphasis as the grade level increased (from zero to 6 percent and from zero to 48 percent, respectively). For the most part, however, there is little evidence of increasingly complex topics in successive grades.

EXHIBIT 2.4

Percentage of Emphasis Mathematics Teachers in the Longitudinal Teacher Survey Give to Measurement, by Grade (n=181)



Source: Longitudinal Teacher Survey, Fall 1997 (1996-97 school year).
How to read this exhibit: The first bar shows that kindergarten teachers in the longitudinal teacher survey report a 10 percent emphasis on measurement. Each bar and the number on top of it represent the percent of emphasis given to measurement for teachers in each grade.

EXHIBIT 2.5

Relative Emphasis on Subtopics in Measurement by Grade, as Reported by Teachers in the Longitudinal Teacher Survey (n=181)

	K	1	2	3	4	5	6	7	8	9	10	11	12	Trend
Use of instruments	33.6	20.0	8.0	20.4	23.1	23.2	12.8	9.7	6.6	7.6	3.6	3.6	9.4	Decrease
Conversions	1.5	0.5	0.6	2.2	5.9	5.6	8.5	7.9	9.0	4.1	4.9	2.8	2.9	None
Metric system	0	11.7	1.9	7.3	5.5	9.4	12.1	11.6	5.9	4.0	2.9	2.0	1.2	None
Length, perimeter	9.6	7.6	4.8	9.5	10.1	12.9	15.7	17.4	12.2	16.2	7.6	9.1	6.4	None
Area, volume	4.3	3.0	1.8	9.3	11.9	11.3	14.7	11.1	12.6	14.7	10.0	8.6	4.3	None
Telling time	18.1	31.3	30.9	18.9	15.9	7.3	na	na	na	na	na	na	na	None
Non-decimal money	2.7	12.8	35.3	11.9	6.2	8.7	na	na	na	na	na	na	na	None
Circles	1.7	1.4	1.2	0.6	3.9	7.2	8.6	9.7	13.6	10.6	6.8	5.8	7.0	None
Mass	5.5	4.0	2.1	4.2	6.7	5.8	4.4	3.9	3.4	2.6	2.7	1.2	0.7	None
Time, temperature	22.6	7.7	13.3	15.6	10.1	8.8	9.0	3.7	4.8	2.9	2.7	3.8	1.1	Decrease
Theory	na	na	na	na	na	na	2.3	2.6	1.6	2.2	1.9	1.2	0.6	None
Surface area	na	na	na	na	na	na	3.3	9.0	8.2	4.7	7.3	2.9	5.1	None
Angles	na	na	na	na	na	na	7.1	8.3	6.9	9.5	5.6	8.2	5.1	None
Pythagorean theory	na	na	na	na	na	na	0	2.7	10.0	9.7	7.2	6.8	6.4	Increase
Simple trig, right triangles	na	na	na	na	na	na	0	0.3	1.6	7.5	31.0	38.3	47.8	Increase
Speed	na	na	na	na	na	na	1.4	2.1	3.6	3.7	5.9	5.7	2.2	None

Source: Longitudinal Teacher Survey, Fall 1997 (1996-97 school year).
How to read this exhibit: The first cell shows that Kindergarten teachers place 33.6 percent of topic emphasis on Use of Instruments. Use of Instruments received 20 percent of the relative emphasis by 1st grade teachers, 8 percent by 2nd grade teachers, 20.4 percent by 3rd grade teachers, 23.1 percent by 4th grade teachers, 23.2 percent by 5th grade teachers, 12.8 percent by 6th grade teachers, 9.7 percent by 7th grade teachers, 6.6 percent by 8th grade teachers, 7.6 percent by 9th grade teachers, 3.6 percent by 10th grade teachers, 3.6 percent by 11th grade teachers, and 9.4 percent by 12th grade teachers. Overall, there was a decreasing trend in the relative emphasis on Use of Instruments by teachers as the grade level increases.

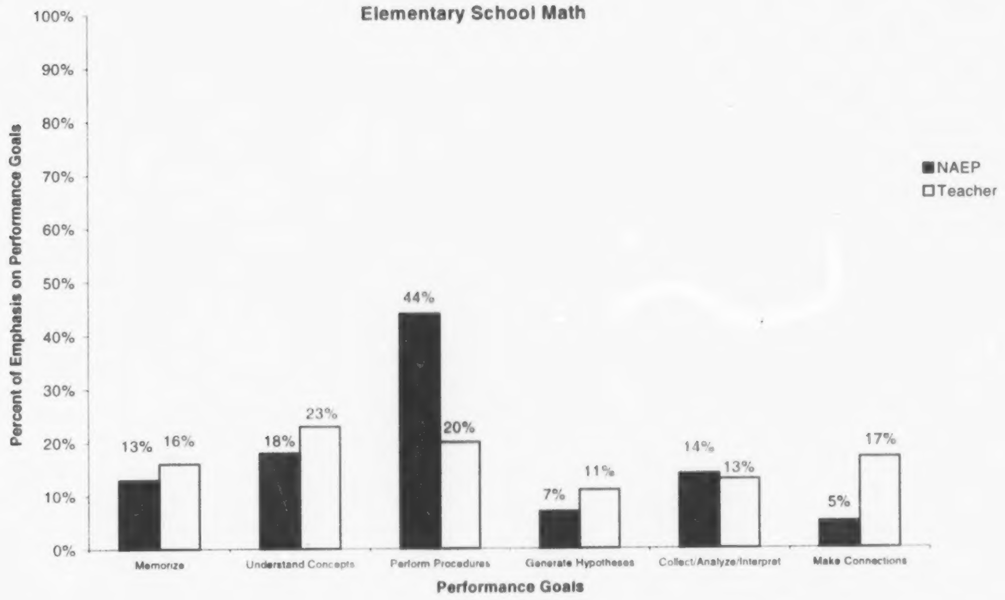
Performance Goals and High Standards

In this section, we compare the performance goals emphasized by teachers in our sample with the performance goals emphasized in the NAEP. Prompted in part by the report *A Nation at Risk* (NCEE, 1983), there has been a movement toward teaching for understanding rather than memorizing (Roitman, 1998). National mathematics and science standards emphasize teaching for understanding. Teaching for understanding and teaching for memorizing are *performance goals*, or expectations teachers have for what students should be able to do. Ideally, teachers would have performance goals for students that are consistent with the performance goals advocated in the national standards. Of the six performance goals teachers could identify on the Longitudinal Teacher Survey (i.e., memorize, understand concepts, perform procedures, generate hypotheses, collect/analyze/interpret data, make connections), four are especially relevant for the abstract thinking involved in developing complex understanding: understanding concepts, generating hypotheses, collecting/analyzing/interpreting data, and making connections. Of the six performance goals, two are especially relevant for developing concrete skills and knowledge: memorizing and performing procedures. Ideally, teachers will balance their emphasis on the six performance goals. In this section, we examine whether teachers have balanced performance goals for their students, comparing teachers' performance goals to the emphases on the NAEP.

Exhibit 2.6 presents our results for elementary school mathematics. (Results for other teachers in our sample appear in Appendix D.) The results indicate that NAEP items tend to focus on the performance goals that involve less abstract thinking, such as memorizing, which does not exemplify the ideal pattern advocated by the national standards. Compared to the performance goal emphases in the NAEP, teachers in our sample give more equal emphases to all six goals. For example, elementary mathematics teachers report devoting 20 percent of their class time to performing procedures, compared to 44 percent for the NAEP, and they devote 17 percent of their class time to making connections, compared to 5 percent for the NAEP.

EXHIBIT 2.6

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Emphasis on Performance Goals (n=74)



Source: Longitudinal Teacher Survey, Fall 1997 (1996-97 school year).
How to read this exhibit: The first bar shows that the NAEP has a relative emphasis of 13 percent on the performance goal Memorize, and the second bar shows that teachers in our sample indicate a relative emphasis of 16 percent on the performance goal Memorize. Each performance goal is included in the bar chart. The relative emphasis can be between 0 and 100 percent.

To examine differences across types of teachers in the emphasis given to the six performance goals, we computed the mean percent emphasis for each goal by school level (elementary, middle, and high school), subject (mathematics and science), and school poverty (high and low). Results indicate that mathematics teachers emphasize the more concrete performance goal, performing procedures, significantly more than science teachers do, while science teachers emphasize the more abstract performance goals—collecting, analyzing, and interpreting data, making connections, and generating hypotheses—significantly more than mathematics teachers do. Teachers in high-poverty schools place significantly greater emphasis on memorizing and significantly less emphasis on understanding concepts, compared to teachers in low-poverty schools. High school teachers place significantly greater emphasis on performing procedures than either elementary or middle school teachers, and significantly less emphasis on generating hypotheses than middle school teachers; this reinforces the finding noted earlier, that instruction does not seem to be more complex or abstract at higher grade levels (see Exhibit 2.7).

EXHIBIT 2.7

Mean Percent Emphasis Given to Each Performance Goal (Standard Deviation), by School Level, Subject, and Poverty Level (n=355)

	Memorize	Understand Concepts	Perform Procedures	Generate Hypothesis	Collect/ Analyze/ Interpret	Make Connections
School Level						
Elementary	15.74 (0.07)	23.94 (0.12)	18.19 (0.06) ●	11.72 (0.06)	13.07 (0.05)	17.22 (0.05)
Middle	15.55 (0.08)	21.84 (0.05)	18.32 (0.05) ●	12.63 (0.05) ▲	13.98 (0.06)	17.65 (0.05)
High	15.59 (0.06)	23.47 (0.07)	20.37 (0.07) ▼▼	10.81 (0.05) ●	12.97 (0.06)	16.78 (0.06)
Subject						
Mathematics	15.76 (0.06)	23.15 (0.07)	22.18 (0.06) ▲	10.66 (0.06) ●	11.70 (0.06) ●	16.46 (0.05) ●
Science	15.51 (0.08)	23.45 (0.11)	15.75 (0.04) ●	12.54 (0.05) ▼	14.84 (0.05) ▼	17.87 (0.05) ▼
Poverty Level						
High Poverty	16.60 (0.07) ▲	21.75 (0.07) ●	18.06 (0.05)	12.46 (0.05)	13.86 (0.05)	17.17 (0.05)
Low Poverty	15.09 (0.06) ●	24.18 (0.10) ▼	19.59 (0.07)	11.09 (0.06)	12.88 (0.06)	17.14 (0.06)

Source: Longitudinal Teacher Survey, Fall 1997 (1996-97 school year).
How to read this exhibit: The group of three cells at the upper left of the table (the means for memorize by school level) shows that there is not a significant difference in the emphasis on memorization between elementary, middle, and high school teachers. The table should be read by columns, focusing on each performance goal separately.
Note: The arrows indicate significant differences between groups (p<.05), with the head of the arrow showing the direction of the difference.

The emphases teachers in this study give to the six performance goals found in this study are inconsistent with previous studies of teachers' instructional emphases. In the early 1980s, studies of 41 elementary school teachers found that 70 to 75 percent of mathematics instruction focused on teaching students skills, such as addition, with little attention to developing conceptual understanding or problem solving (Porter, 1989). In a groundbreaking study of mathematics and science instruction in high school, Porter et al. (1993) found that in 1990 and 1991, teachers reported focusing most on solving routine problems (e.g., computation), in both mathematics and science. The performance goal of building and revising theory and developing proofs was emphasized very little. Observations confirmed that teachers did, in general, focus on the more rote performance goals such as memorizing facts, definitions, and equations, performing procedures, and solving routine problems. The TIMSS videotape classroom study also found an emphasis on routine procedures in U.S. mathematics classes (Stigler et al., undated). Teachers in the current study, however, report no greater emphasis on rote skills, such as memorization, than on conceptual development skills, such as making connections.

It could be that the low emphasis on rote skills reported here reflects teachers' *beliefs* about their instruction (Cohen, 1990). For example, Knapp et al. found that many teachers who were trying to use new instructional practices to improve student understanding "got the words but not the tune," or used new learning activities without understanding or capitalizing on their potential (Knapp et al., 1993: p. 23); and in a study of 25 mathematics teachers professing familiarity with and use of standards-based instructional strategies, only four truly demonstrated the intent of the standards (Spillane & Zeuli, 1999).

The Eisenhower evaluation observations found examples of similar differences between teachers' perceptions of their instruction and observers' analyses of the same classes. An elementary school in Richmond provides an example of the discrepancy between a teacher's description of her instruction and a trained observer's description of the same class. For the first half of this lesson, the teacher led a whole-class review of operations (e.g., addition, subtraction, exponents, square roots). She wrote pieces of equations on the chalkboard and asked students to fill in the missing information. While the lesson allowed students to "create" equations, the thinking tasks were defined within very narrow parameters, and the focus of the lesson was on arriving at the "correct answer." The teacher felt that she was emphasizing complex performance goals such as interpreting data and making connections for more than half of this part of the lesson (66 percent). The two observers, however, saw an emphasis on lower level performance goals, such as performing procedures and memorizing (60 percent).

A middle school in Rhinestone provides an example of a lesson that emphasizes more complex performance goals. In this middle school science lesson, students constructed a bridge out of spaghetti and marshmallows. The bridge had to meet certain specifications of length and width and have certain characteristics (e.g., it had to have two piers). According to the teacher, this project was intended to make more concrete the construction problems students had been discussing in previous classes. The class was part of a larger unit on bridges and other structures, and the unit was part of an inquiry-based curriculum designed by the observed teacher and a peer.

After the class, the teacher and the observer separately identified the performance goals and topics emphasized in the class. Both the teacher and the observer felt the lesson stressed performance goals that had to do with developing complex understanding. The teacher and observer gave favorable descriptions of the class. Both agreed on the percentage of emphasis the lesson gave to memorizing. But the teacher felt that she placed more emphasis on understanding content than the observer thought she did.

Clearly, in some cases, teachers are emphasizing performance goals of increased student understanding. However, in some cases, changes in instruction may not be at the level that would improve student understanding.

These observations raise the question of the prevalence of teacher exaggeration in their reported instruction. Do teachers, in general, tend to over-report performance goals that they see as positive? The second example shows that teachers do not consistently exaggerate. Yet the first example shows that some teachers may report a more favorable picture of their instruction than is observed. Although we cannot conclusively determine the accuracy of teachers' reporting from these data, the self-reporting bias, if any, should not have much influence on the analyses of change in teaching practice to be discussed in our third report, because we would expect any bias to be constant across the three waves of the survey.

As previous research suggests, there may be a gap between the teacher's perception of her instruction and a more objective evaluation of the same lesson. Teachers may believe they are teaching in ways consistent with high standards; without feedback on their instruction, they may not recognize areas for improvement. Well-constructed professional development, which provides opportunities for such feedback, may help teachers continue to evaluate and improve their instruction.

Content Emphases: The Intersection of Topics and Performance Goals

In this section, we turn to the emphasis teachers give to specific content areas—that is, to the intersection of topics and performance goals. As noted above, the idea of "content" includes both the topic of instruction and the teacher's goals for student performance.

The mathematics and science standards present a vision for instruction, in which each grade builds on the learning in the previous grade. However, research on teaching practice and findings reported earlier from the current study suggest that subtopics and performance goals do not become more challenging as students move through the grades. Rather, students visit and revisit the same topics and subtopics at a superficial level. This curriculum organization contributes to a phenomenon in the U.S. recognized as "teaching for exposure" (Porter, 1989). Because many topics and subtopics are taught at more than one grade level, teachers provide very limited instruction in a large number of topics and subtopics. This practice is unlikely to deepen students' understanding of any particular topic (Rollefson, 1996). Effective instruction must balance covering a variety of content areas (breadth) with developing deep understanding in each content area (depth), perhaps even emphasizing depth by limiting breadth somewhat (Raizen, 1998).

To assess the depth and breadth of content covered, we counted the total number of possible content areas (cells) in our matrix. We then determined the percentage of cells that teachers reported covering, and compared this percentage with content areas (cells) assessed by the NAEP. Our results, shown in Exhibit 2.8, indicate that teachers' instruction shows greater breadth than is reported on the NAEP. While the NAEP does not assess and the surveyed teachers do not cover all possible content areas, teachers consistently cover substantially more content areas than represented in the NAEP, in some cases as much as twice as many areas.[13] For example, teachers cover 39 percent of the 144 content areas in middle school science, while the NAEP assesses only 16 percent.[14] Teachers in high-poverty schools tend to cover more content areas than teachers in low-poverty schools.

EXHIBIT 2.8

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Coverage of Content Areas (n=355)

	Mathematics			Science		
	Elementary School	**Middle School**	**High School**	**Elementary School**	**Middle School**	**High School**
Number of possible content areas	60	54	96	96	144	168
Percent assessed by NAEP	35%	34%	20%	26%	16%	15%
Percent covered by teachers	47%	51%	43%	36%	39%	32%

Source: Longitudinal Teacher Survey, Fall 1997 (1996-97 school year).
How to read this exhibit: The first column shows that for elementary school mathematics, there are 60 possible content areas. Thirty-five percent of the possible content areas were assessed by NAEP. Forty-seven percent of the content areas are covered by teachers in our sample. Coverage of content areas data are listed in the rows. Grade levels are in the columns. The possible coverage can be between zero and 100 percent.

Covering a large number of content areas is not necessarily an instructional liability; however, if by covering more content areas teachers are unable to focus on each content area as thoroughly as needed, students may not have opportunities to develop deep understandings in each area. Our data suggest this is the case. In comparison to the NAEP items, teachers cover more content areas, giving many relatively little emphasis. For example, Exhibit 2.9a shows that in elementary school science, the NAEP gives strong emphasis (greater than 3 percent emphasis) to 11 content areas; Exhibit 2.9b shows that teachers report strong emphasis on only three content areas. On the other hand, the NAEP gives weak emphasis (1 to 2 percent emphasis) to only 15 content areas, shown in Exhibit 2.9a, while teachers report a weak emphasis on 27 areas. This pattern is found across subjects (i.e., mathematics, science) and school levels (i.e., elementary, middle, high school). As previous research suggests, and the current analysis reiterates, teachers tend to favor breadth over depth in their instruction.

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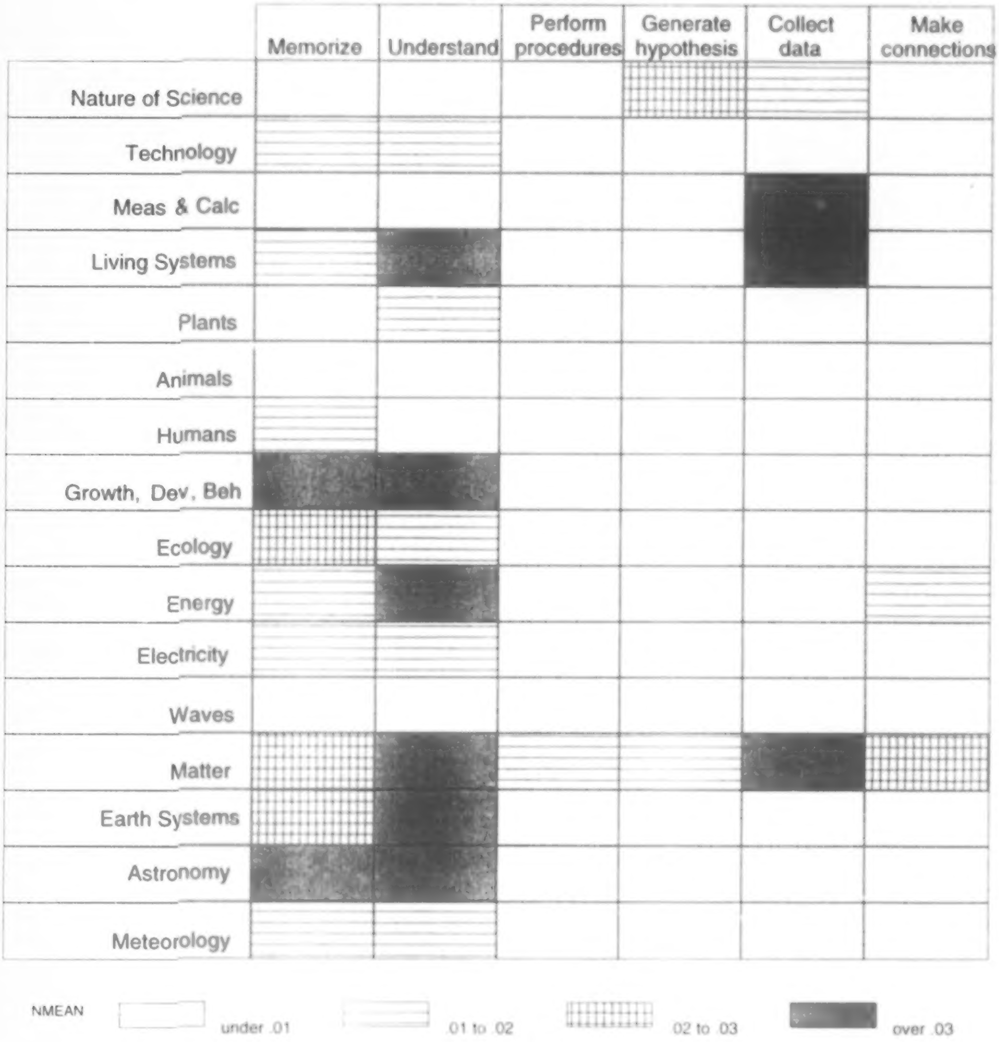
[13] Some performance goals that are especially difficult to measure on a timed, paper-and-pencil test, such as generating hypotheses, may be underrepresented on the NAEP.

[14] This difference might be due, in part, to the fact that the teachers reported on *all* content areas covered over the course, while the NAEP only tests on a *sample* of content areas that students are expected to learn. However, the analysis included the full set of NAEP items, which is a sizable sample of items, so NAEP content coverage should be substantial.

EXHIBIT 2.9a

Emphasis on Content Areas in Fourth-Grade Science NAEP Items



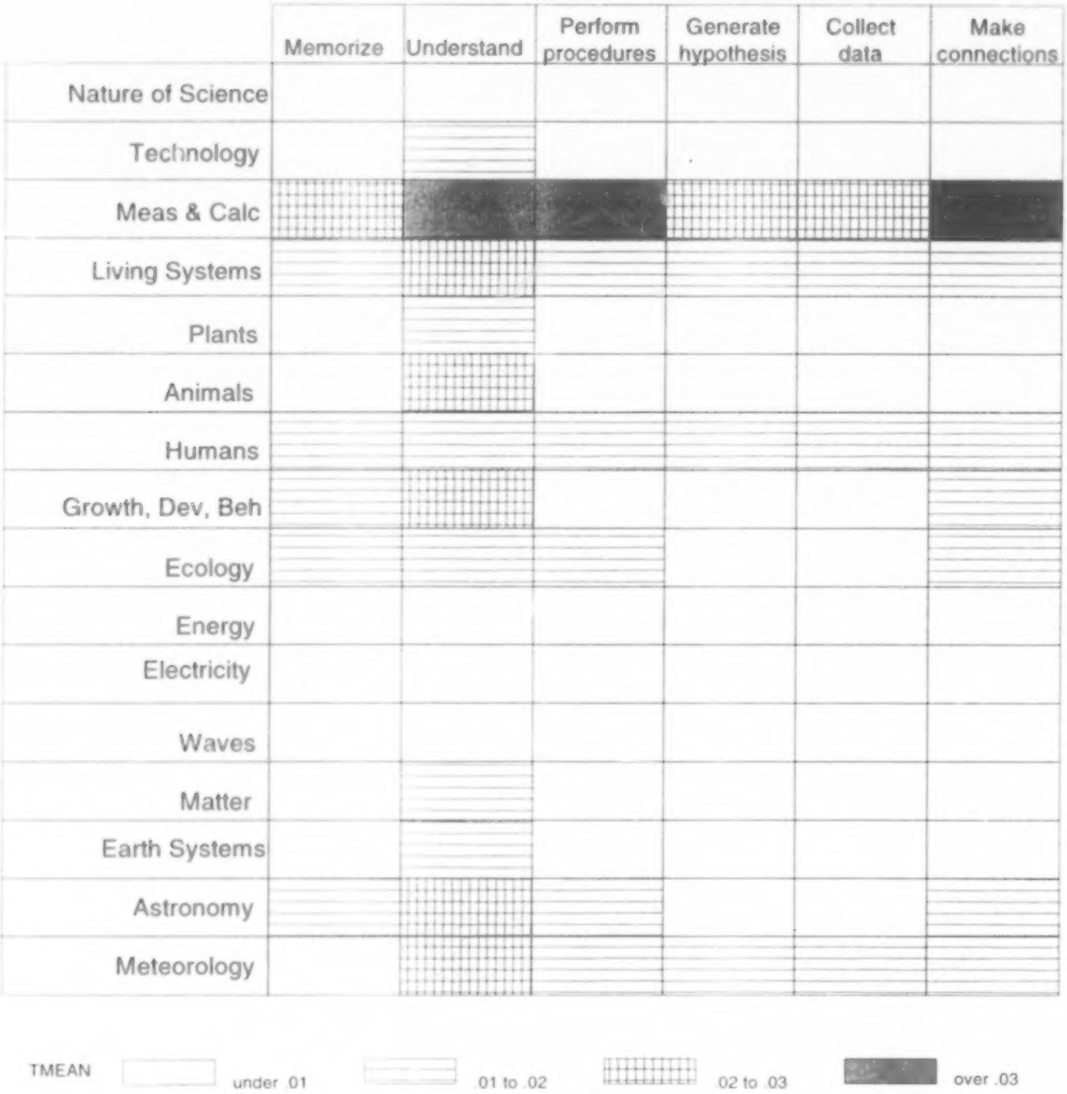
	Memorize	Understand	Perform procedures	Generate hypothesis	Collect data	Make connections
Nature of Science				▦	▤	
Technology	▤	▤				
Meas & Calc					■	
Living Systems	▤	■			■	
Plants		▤				
Animals						
Humans	▤					
Growth, Dev, Beh	■	■				
Ecology	▦	▤				
Energy	▤	■				▤
Electricity	▤	▤				
Waves						
Matter	▦	■	▤	▤	■	▦
Earth Systems	▦	■				
Astronomy	■	■				
Meteorology	▤	▤				

NMEAN ☐ under .01 ▤ .01 to .02 ▦ .02 to .03 ■ over .03

Source: NAEP, 1996.
How to read this exhibit: The rows represent topic areas and the columns performance goals. Each cell is a topic area and performance goal combination. Blank boxes indicate less than one percent of relative emphasis for a particular topic and performance goal combination by NAEP. Boxes with horizontal lines indicate between one and two percent of relative emphasis for a topic and performance goal combination by NAEP. Checkered boxes indicate two to three percent of relative emphasis for a topic and performance goal combination by NAEP. Shaded boxes indicate over three percent of relative emphasis for a topic and performance goal combination by NAEP. For the Nature of Science, under one percent of the relative emphasis given by NAEP items was on the performance goal Memorize.

EXHIBIT 2.9b

Emphasis on Science Content Areas, Reported by Elementary School Teachers in the Longitudinal Teacher Survey (n=69)



	Memorize	Understand	Perform procedures	Generate hypothesis	Collect data	Make connections
Nature of Science	□	□	□	□	□	□
Technology	□	▤	□	□	□	□
Meas & Calc	▦	■	■	▦	▦	■
Living Systems	▤	▦	▤	▤	▤	▤
Plants	□	▤	□	□	□	□
Animals	□	▦	□	□	□	□
Humans	▤	▤	▤	▤	▤	▤
Growth, Dev, Beh	▤	▦	□	□	□	▤
Ecology	▤	▤	▤	□	□	▤
Energy	□	□	□	□	□	□
Electricity	□	□	□	□	□	□
Waves	□	□	□	□	□	□
Matter	□	▤	□	□	□	□
Earth Systems	□	▤	□	□	□	□
Astronomy	▤	▦	▤	□	□	▤
Meteorology	□	▦	▤	▤	▤	▤

TMEAN □ under .01 ▤ .01 to .02 ▦ .02 to .03 ■ over .03

Source: Longitudinal Teacher Survey, Fall 1997 (1996-97 school year). Kindergarten through fifth grade teachers.
How to read this exhibit: The rows represent topic areas and the columns performance goals. Each cell is a topic area and performance goal combination. Blank boxes indicate less than one percent of relative emphasis for a particular topic and performance goal combination by teachers. Boxes with horizontal lines indicate between one and two percent of relative emphasis for a topic and performance goal combination by teachers. Checkered boxes indicate two to three percent of relative emphasis for a topic and performance goal combination by teachers. Shaded boxes indicate over three percent of relative emphasis for a topic and performance goal combination by teachers. For the Nature of Science, under one percent of the relative emphasis given by teachers in the longitudinal teacher survey was on the performance goal Memorize.

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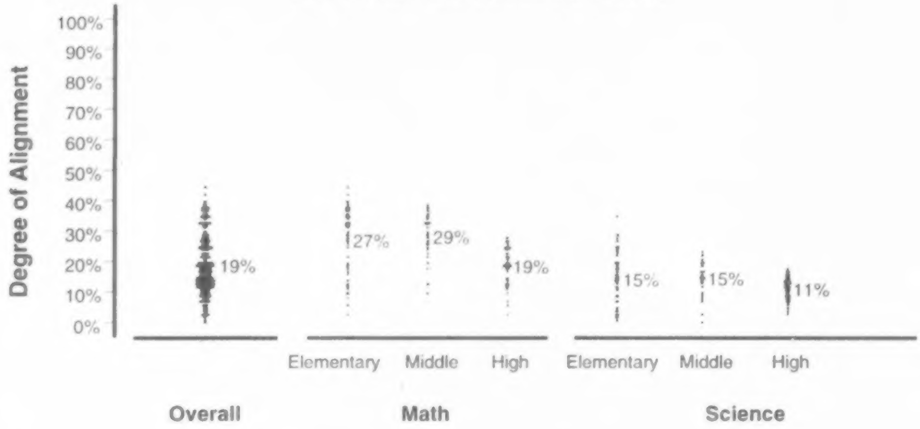
Alignment between Content Emphases and High Standards

Finally, in this section, we report an overall measure of the alignment between the content areas taught by teachers in our sample and the content areas emphasized by the NAEP. We computed the measure based on the relative emphasis given to each content area in our matrix (each cell) by the teachers and by the NAEP.[15] For each teacher, the index takes on a value ranging from zero (no agreement at all between the content areas the teacher emphasizes and those emphasized by the NAEP) to 100 percent alignment (complete agreement between the content areas emphasized by the teacher and the NAEP). High alignment indicates that teachers emphasize topics and performance goals that were similar to NAEP's emphasis. For example, teachers might focus especially on understanding concepts (a performance goal) for motion and forces (a topic) by asking students to explain, in everyday terms, the relationship between motion and force. If the NAEP also emphasizes understanding concepts for motion and forces, there would be high agreement between instruction and the NAEP on that content area. If there were a pattern of such agreement across content areas, then the index of alignment would be high.

Depending on the subject (i.e., mathematics or science) and the school level (i.e., elementary, middle, or high school), the average alignment between the surveyed teachers' instruction and the NAEP ranges from 11 to 29 percent (see Exhibit 2.10). Considering the large number of content areas, alignment of 29 percent is quite high. There is no significant difference in alignment between high- and low-poverty schools.

EXHIBIT 2.10

Degree of Alignment between Teachers' Instructional Emphases and NAEP Emphases (n=355)



Source: Longitudinal Teacher Survey, Fall 1997 (1996-97 school year).
How to read this exhibit: The first distribution shows that on average teachers' instructional emphases is aligned 19 percent with the NAEP emphases. Each dot represents one teacher in our sample. As the number of teachers at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

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[15] The index of alignment is computed as the sum, across content areas, of the absolute value of the difference between the teacher's and the NAEP emphasis in each content area, divided by two, subtracted from one; the result is multiplied by 100. The absolute value is required because the index is designed to capture cells for which the teachers give more emphasis than the NAEP, as well as those for which they give less emphasis.

As can be seen in Exhibit 2.10, the content of instruction for teachers in our sample is better aligned with the NAEP in mathematics than in science. There are a number of possible reasons for this. Mathematics often is seen as a core subject; everyone generally agrees that children should learn fractions or geometry. Science, however, is not always so central to the curriculum, especially in the early grades (Kennedy, 1998; Raizen, 1998). At all levels, students have less exposure to science than to mathematics: 30 minutes per day for science compared to 60 minutes per day for mathematics in elementary schools, and two to three years of mathematics compared to two years of science required in high school (Weiss, 1997). Further, there is greater national consensus on core topics in mathematics than in science: state mathematics curricula tend to focus on common topics, while there is little overlap between states in terms of science emphasized by the state curricula (Schmidt et al., 1996).

Finally, teachers may be less familiar with science, and this could affect the quality of instruction. Elementary school teachers generally have a basic understanding of reading and mathematics, and feel comfortable teaching these subjects; however, they may be less knowledgeable about and comfortable teaching science. Research suggests that teachers' content knowledge affects their instruction (Rollefson, 1996). A survey of elementary school mathematics and science teachers found that 60 percent felt qualified to teach mathematics, 28 percent felt qualified to teach life sciences, and fewer than 10 percent felt qualified to teach physical science (Weiss, 1997). Teachers teaching out-of-field may misrepresent key concepts or focus on trivial rather than central concepts and tend to rely on drill-and-practice activities rather than instruction oriented toward student inquiry. Further, because the science standards are relatively new, teachers and students have had limited time to become familiar with them.

Our data also indicate that content was more highly aligned with the NAEP in the elementary and middle schools than in the high schools. This phenomenon might be an artifact of the test. Although the NAEP is used as a standard for high expectations, the high school test is geared toward content covered prior to high school. Thus, the standard set by the high school NAEP test might not be as challenging as the instruction of teachers who participated in the Eisenhower evaluation. Although most of the high school teachers in the sample described average-level courses, such as algebra and biology, some did describe advanced courses such as calculus and physics, and honors courses (see Appendix D).

Our data indicate that the degree of alignment of the content taught with high standards seems to be related to the school in which instruction occurs. As much as 30 percent of the difference among surveyed teachers in terms of how well their instruction meets high standards can be attributed to the school in which the teacher teaches (see Appendix D). Our data indicate that the effect of the school on alignment with the NAEP is greater for science than for mathematics instruction, and greater for elementary and middle schools than high schools. These findings imply that, at least for this sample, strategies to help teachers improve instruction should be targeted to schools.

Finally, although we talk about average alignment across groups of teachers, teachers differ from each other in how closely their instruction aligns with the NAEP. This variation is quite visible in Exhibit 2.10, which shows that some teachers are nearly 50 percent aligned with the NAEP, while others have almost no alignment. For example, the instruction of one elementary school science teacher (called Teacher A) was minimally aligned with the NAEP: on an index of zero to 100, with 100 indicating perfect alignment, she had alignment of less than one percent. On the other hand, the instruction of another elementary school science teacher (called Teacher B) was relatively highly aligned with the NAEP: in the alignment index, she had alignment of 35 percent. The performance goals and topics that Teacher B emphasized resembled the NAEP much more closely than the performance goals and topics of Teacher A. Teacher B stressed memorizing and understanding, as the NAEP does, while Teacher A stressed performing procedures and collecting/analyzing/interpreting data, unlike the NAEP. Teacher B emphasized components of living systems, ecology, properties of matter, and astronomy similarly to the NAEP, while Teacher A emphasized maintenance in animals, unlike the NAEP. A teacher such as Teacher B, whose instruction already meets high standards, may not need the same type of guidance as a teacher such as Teacher A, whose instruction is weak compared to the standards.

Summary: Content Coverage and High Standards

Data from the baseline Longitudinal Teacher Survey indicate that the content taught by teachers in our sample is moving toward but does not yet meet high national standards in several ways. Teachers do not focus on some advanced topics; rather, they emphasize low-level topics. Although teachers set more complex performance goals for their students than they have historically, the changes in their instruction are not always as deep as the teachers perceive them to be. Teachers appear to teach for exposure, and the content covered does not appear to become substantially more challenging in successive grades. These findings are generally consistent with previous research, which suggests that instruction in American schools does not emphasize challenging content.

Targeted professional development can help address these concerns. For example, professional development that focuses on content can help teachers develop a deeper understanding of the content they teach and develop lessons that are rich in challenging content (Kennedy, 1998). Professional development with in-classroom follow-up components could help teachers understand the level at which their instruction has changed and the areas in which the intended change is still superficial. (See, for example, Schifter, 1996). School-based professional development that includes the collective participation of groups of teachers from the same grade could help teachers organize instructional emphases across grades, so that each successive grade builds on the previous one. Later chapters examine the prevalence of these types of designs and characteristics in Eisenhower-assisted professional development activities and their relationship to teacher outcomes.

PEDAGOGY AND HIGH STANDARDS

Section Findings

- *Science teachers, elementary school teachers, and teachers in low-poverty schools report using more nontraditional pedagogy compared to mathematics teachers, middle and high school teachers, and teachers in high-poverty schools.*

- *Teachers who emphasize concrete performance goals for their students, such as memorizing, tend to report using traditional, teacher-centered pedagogy. Teachers who give more emphasis to abstract performance goals for their students, such as understanding concepts, tend to report using active, project-centered pedagogy.*

To this point, we have focused on the content of instruction: the topics and performance goals that teachers emphasize, and how they compare to high standards for content. However, the delivery of instruction—the pedagogy—also is important to effective teaching. Students learn best when they are actively involved in learning, when assessment tools are used to tailor the lesson to the students' individual needs, and when students have access to a variety of tools and modes for learning. However, according to the literature, traditional instruction tends to be led by the teacher and de-emphasizes student-initiated activities other than highly structured individual seatwork (for example, completing exercises in a text or on worksheets) (Gamoran, Secada, & Marrett, 1998). Traditional instruction entails at least two dimensions: an emphasis on teacher presentation and highly structured lessons using traditional materials (e.g., texts). Conversely, nontraditional instruction revolves around student-initiated activities, including projects and discussion, and the use of innovative materials (e.g., manipulatives). Research suggests that teachers are beginning to explore nontraditional pedagogy, and to use a mix of traditional and nontraditional pedagogy in their instructional practice (Spillane & Zeuli, 1999).

In this section of the chapter, we describe and analyze the pedagogical approaches of teachers in our sample. We conducted analyses on a series of six questions in the Longitudinal Survey about teachers' pedagogical strategies. Based on these analyses, we first describe these teachers' classes: the average percent of time teachers and students spend in various types of activities, the average relative emphasis on different types of tasks and grouping of students. Next, we identify pedagogical patterns in the class activities, such as didactic instruction or active, project-centered instruction. We look at patterns within our sample, for example identifying where elementary, middle, and high school teachers differ in their pedagogical approaches. (See Appendix D for details on analysis methods.) Finally, we look at the relationship between pedagogy and content, in order to establish empirically whether certain pedagogical approaches are more consistent with high standards for content than others.

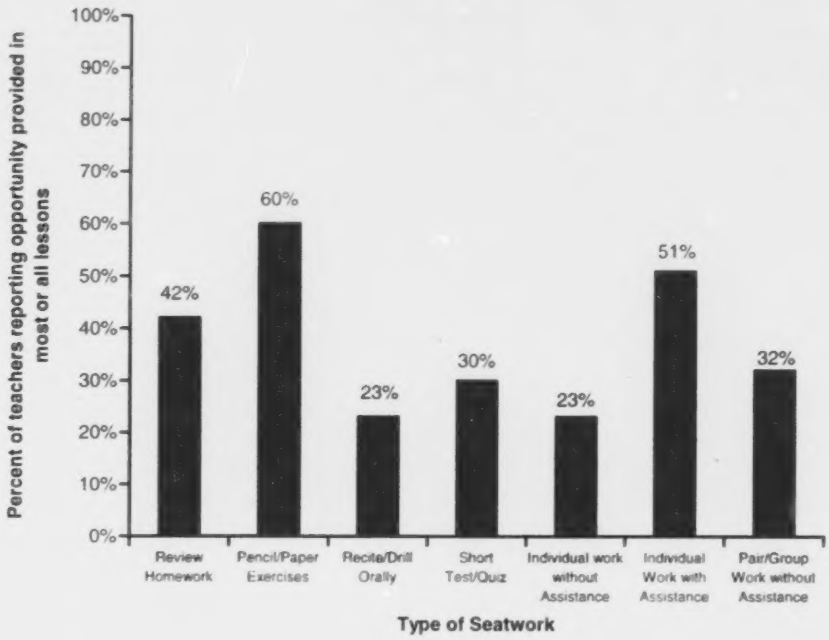
Class Activities

Class activities provide a picture of students' learning experiences. To some degree, the emphasis on some types of activities can show how consistently teachers are using the types of activities advocated by the research.

The teachers in this study spent one-third of their instructional time on teacher-led activities such as lecturing or providing demonstrations, and two-thirds of their instructional time on activities that could actively involve students, such as whole class discussions, small group and individual work, and hands-on experiences. Exhibit 2.11a shows that a high percentage of teachers (23 to 60 percent) have students do traditional activities, such as working on homework, pencil-and-paper exercises, and taking quizzes, in most or all lessons. Exhibit 2.11b shows that a lower percentage of teachers (12 to 31 percent) have students work on nontraditional activities, such as independent long-term projects or problems for which there is not an immediate solution, for most or all lessons.

EXHIBIT 2.11a

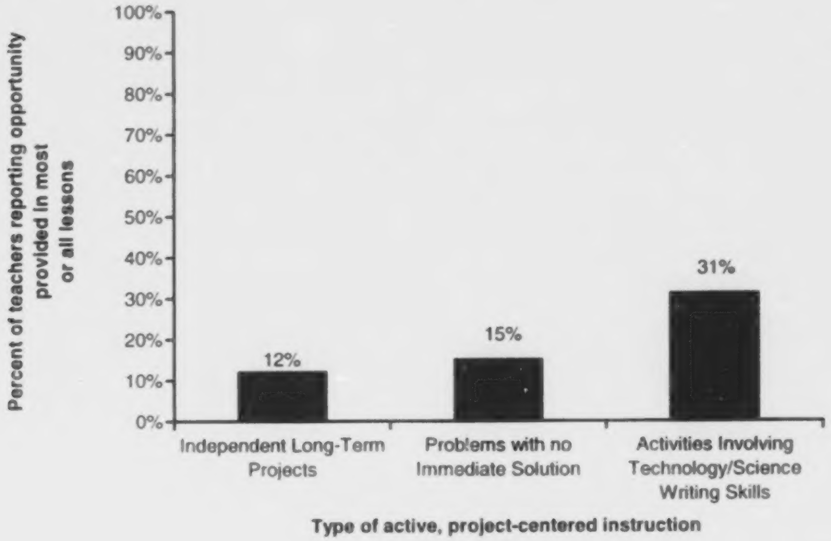
Percent of Teachers Using Traditional Activities in Most or All Lessons (n=355)



Source: Longitudinal Teacher Survey, Fall 1997 (1996-97 school year).
How to read this exhibit: The first bar shows that percent of teachers report using in most or all lessons. Each bar and the number on top of it represent the percent of teachers who report using that activity in most or all lessons.

EXHIBIT 2.11b

Percent of Teachers Using Nontraditional Activities in Most or All Lessons (n=355)



Source: Longitudinal Teacher Survey, Fall 1997 (1996-97 school year).
How to read this exhibit: The first bar shows that percent of teachers report using in most or all lessons. Each bar and the number on top of it represent the percent of teachers who report using that activity in most or all lessons.

Pedagogical Patterns

Research suggests that teachers tend to favor particular approaches to pedagogy, with certain types of class activities occurring together (Peterson, Fennema, Carpenter, & Loef, 1989; Stein, Baxter, & Leinhardt, 1990). While professional development can focus on changing individual classroom activities, such as seatwork, professional development is more likely to have a lasting impact if it targets the teacher's broader pedagogical approach (Hyde, Ormiston, & Hyde, 1994). Therefore, in this section, we identify general pedagogical approaches that represent the ways teachers organize classroom practices.

We conducted a factor analysis on the survey questions noted above to identify pedagogical patterns in instructional activities. Consistent with the research on pedagogy, we found four distinct patterns of activities.

We developed a set of four scales to measure the extent to which teachers rely on these four pedagogical strategies. Each scale is scored to have a mean of 50 for the teachers in our sample. Two measures capture traditional strategies:[16]

1. Didactic instruction: Didactic, or teacher-led, instruction includes the following activities: lecturing and having students take a passive role; de-emphasizing group work, reading, writing, and student presentations; and not using concrete models or interdisciplinary lessons.

2. Individual seatwork: Individual seatwork includes the following activities: working on homework in class, working on pencil/paper exercises, reciting or drilling orally, taking quizzes, and having students work individually, or in pairs.

Two measures capture nontraditional strategies:

1. Active, project-centered instruction: This factor includes the following activities: students working on independent, long-term projects, problems with no immediate solution, and technical writing skills; using hands-on activities; de-emphasizing paperwork and individual work.

2. Discussion-oriented instruction: This measure focuses on discussion only.

The pedagogical approaches we identified here are consistent with the research on pedagogy, giving us confidence that the pedagogy of the teachers in this sample is fairly representative. The national standards, as well as research on pedagogy, indicate that effective instruction calls for an increased emphasis on nontraditional pedagogical approaches, without fully abandoning traditional approaches. The degree to which individual teachers emphasize those pedagogical approaches is one indicator of their consistency with national standards.

Pedagogical Patterns within the Sample

According to the research, pedagogy differs substantially by type of school and subject. For example, high schools tend to have more highly structured lessons, with greater emphasis on individual work, compared to elementary schools. However, national mathematics and science standards consistently emphasize active instruction for all students, regardless of school level, school poverty, or subject. Therefore, it is useful to understand how subgroups of schools and students differ in their use of effective pedagogy. To examine these questions, mean scores were computed on the four pedagogy scales by school level (elementary, middle, and high school), subject (mathematics and science), and poverty level (high and low).

We found some differences among types of teachers and types of schools in the pedagogy favored, as shown in Exhibit 2.12. Mathematics teachers are significantly more likely to use seatwork (traditional) and science teachers are significantly more likely to use active instruction (nontraditional); this is consistent with findings from the observed sites, where mathematics lessons sometimes revolved around textbook work and science lessons often involved labs. Compared to elementary school teachers, high school teachers use more didactic instruction and individual seatwork (traditional), and less discussion-oriented instruction (nontraditional). Low-poverty schools are significantly more likely to use didactic instruction (traditional) than high-poverty schools; otherwise, there is no significant difference between high- and low-poverty schools in types of pedagogy used.

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[16] We also explored a measure of technology use (e.g., computers and calculators), because previous research suggests that teachers traditionally use technology for drill and practice on facts and skills, but that they may be learning to use technology for more advanced learning goals. However, responses to the technology questions seemed to reflect resources (e.g., greater or lesser access to technology) rather than pedagogy (e.g., how technology is used in the classroom). Therefore, it was not appropriate to discuss the technology factor in this section.

EXHIBIT 2.12

Mean Teacher Use of Four Pedagogical Approaches (Standard Deviation), by School Level, Subject, and Poverty Level (n=355)

	Traditional		Nontraditional	
	Teacher-Centered	**Individual Seatwork**	**Active**	**Discussion – Oriented⁺**
School Level				
Elementary	47.13 (5.30)	49.09 (5.92)	50.36 (4.72)	51.38 (8.06)
Middle	50.47 (6.10)	49.41 (5.96)	49.88 (7.95)	50.16 (8.00)
High	53.33 (5.51)	51.33 (5.67)	49.62 (5.65)	48.30 (9.07)
Subject				
Mathematics	50.53 (6.23)	51.66 (5.34)	47.93 (5.70)	50.23 (19.11)
Science	49.85 (6.14)	48.27 (6.00)	52.11 (5.34)	49.66 (8.35)
Poverty Level				
High Poverty	48.46 (6.03)	49.98 (6.24)	49.93 (6.36)	50.60 (8.47)
Low Poverty	51.20 (6.08)	49.96 (5.64)	50.00 (5.66)	49.59 (8.91)

+ n=342

Source: Longitudinal Teacher Survey, Spring 1998.
How to read this exhibit: The group of three cells at the upper left of the table (scale score means for teacher-centered instruction by school level) shows that high school teachers use significantly more teacher-centered instruction than middle school teachers and elementary school teachers, and middle school teachers use significantly more teacher-centered instruction than elementary school teachers. The table should be read by columns, focusing on each pedagogical strategy separately.
Note: Results in table are scale scores, with a mean of 50 for the teachers in the sample. The arrows indicate significant differences between groups ($p<.05$), with the head of the arrow showing the direction of the difference.

The Relationship between Pedagogy and Content

Both pedagogy and content are critical for successful instruction, and teachers who tend to have high standards for one also have high standards for the other. In this section, we examine the relationship between teachers' pedagogical approaches and the content of their instruction to

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determine empirically whether certain pedagogical approaches are consistent with high standards for content. We explore this premise by correlating teachers' pedagogical approaches with the content of their instruction. Teachers whose instruction is well-aligned with NAEP tend to emphasize seatwork and discussion, and de-emphasize active, project-centered instruction (see Exhibit 2.12).

We also focused on one of the two components of content: teachers' performance goals for students (see Exhibit 2.13). It may be that teachers expect a certain level of performance from their students, emphasizing more concrete or more abstract performance goals, and that they choose pedagogical approaches to help their students reach those types of performance goals. We examined the relationship between teachers' performance goals for students and the pedagogical approaches they favor. We found that traditional, didactic instruction emphasizes the more concrete performance goals, such as memorizing and performing procedures, and de-emphasizes performance goals that involve abstract thinking, such as generating hypotheses, collecting/analyzing/interpreting data, and making connections.[17]

EXHIBIT 2.13

Correlations between Pedagogical Approaches and Elements of Content (n=355)

	Didactic	Individual Seatwork	Active, Project-Centered	Discussion-Oriented+
Alignment with NAEP Items				
Index of Alignment	ns	.22***	-.14**	.13*
Performance Goals				
Memorize	.22***	ns	-.22***	ns
Understand Concepts	.18***	-.21***	ns	ns
Perform Procedures	.12*	.15**	-.26***	ns
Generate Hypotheses	-.25***	.13*	.25***	ns
Collect/Analyze/ Interpret Data	-.24***	ns	.28***	ns
Make Connections	-.21***	ns	.19***	ns

+ n=342
* statistically significant at p<.05
** statistically significant at p<.01
*** statistically significant at p<.001
ns not statistically significant

Source: Longitudinal Teacher Survey, Spring 1998.
How to read this exhibit: The first cell shows that didactic pedagogy is significantly correlated with the performance goal of memorizing; in other words, the more that teachers emphasize memorizing, the more that they present or lecture. The table should be read by columns, focusing on each pedagogical strategy separately.

Nontraditional, active instruction, on the other hand, emphasizes complex performance goals including generating hypotheses, collecting/analyzing/interpreting data, and making connections, and de-emphasizes more concrete performance goals, including memorizing and performing procedures. In other words, teachers who would like their students to develop more concrete performance goals, such as memorizing, tend to use traditional, didactic pedagogy and teachers who would like their students to develop abstract performance goals, such as making connections, tend to use active, project-centered pedagogy. This finding is consistent with the literature on pedagogy, as well as national pedagogical standards for mathematics and science, which advocate using active instruction to help students develop complex thinking skills.

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[17] Contrary to expectations, the performance goal of students' understanding concepts is related to traditional instruction. It may be that teachers see this performance goal as concrete (e.g., students can recite a research theory) rather than abstract (e.g., students can explain a research theory).

Summary: Pedagogy and High Standards

Traditional and nontraditional teaching strategies can be, and are, part of instruction that meets high standards. Some teachers incorporate seatwork with discussion, and the results indicate that both seatwork and discussion are related to high content standards. Some, but not all teachers incorporate nontraditional pedagogy that actively involves students into their teaching. Professional development can play a key role in helping teachers learn to integrate traditional and nontraditional teaching strategies, and help them improve the quality of student-centered instruction. For example, in-class observations and feedback, following professional development experiences, can help teachers understand whether they are using the tools of active instruction on a superficial level (e.g., discussions that are geared to identifying the "correct" answer) or pushing students toward more complex understanding (e.g., discussions that encourage students to surface underlying concepts). Later chapters in this report will examine the extent to which Eisenhower-assisted activities offer active learning opportunities, as well as other characteristics of high-quality professional development. We also will examine how the design and characteristics of Eisenhower-assisted activities are related to teacher outcomes.

SUMMARY AND CONCLUSIONS

In this chapter, we have established a baseline understanding of the approaches to instruction reported by teachers in the Longitudinal Study of Teacher Change. By comparing the content covered by teachers in the sample with content included in NAEP items, critical areas have been identified where professional development could contribute to teaching practice.

In addition, we have examined the degree to which teachers in the sample rely on traditional and non-traditional pedagogical methods. Prior research indicates that at least two elements of instruction matter for student learning: content that is aligned with high standards and pedagogy emphasizing active learning. The sampled teachers are working toward both elements of effective instruction, but are not there yet.

CHAPTER 3

TEACHERS' EXPERIENCES IN EISENHOWER-ASSISTED PROFESSIONAL DEVELOPMENT ACTIVITIES

The goal of professional development is to improve teaching. In the last chapter, we discussed the strengths and weaknesses of current teaching practice in mathematics and science, and we identified areas in which professional development appears to be needed. In particular, many teachers do not appear to give sufficient attention to advanced topics, and many attempt to cover too many topics in too little depth. In addition, although many teachers have begun to employ active, discussion-oriented teaching strategies, the use of these strategies is frequently superficial. We now begin to examine the features of professional development that are associated with changes in teaching.

Title II of the Elementary and Secondary Education Act, as amended by the Improving America's Schools Act of 1994, states as its purpose to increase the quality of professional development and provide professional development to teachers of at-risk students. The legislation states that its purpose is to provide teachers with access to "sustained and intensive high-quality professional development" (Section 2002(1)) that among other things "is of sufficient intensity and duration to have a positive and lasting impact on the teacher's performance in the classroom" (Section 2002(2)(E)). The legislation also seeks to provide professional development that "reflects recent research on teaching and learning" (2002(2)(B)) and "includes strong academic content and pedagogical components" (2002(2)(C)).

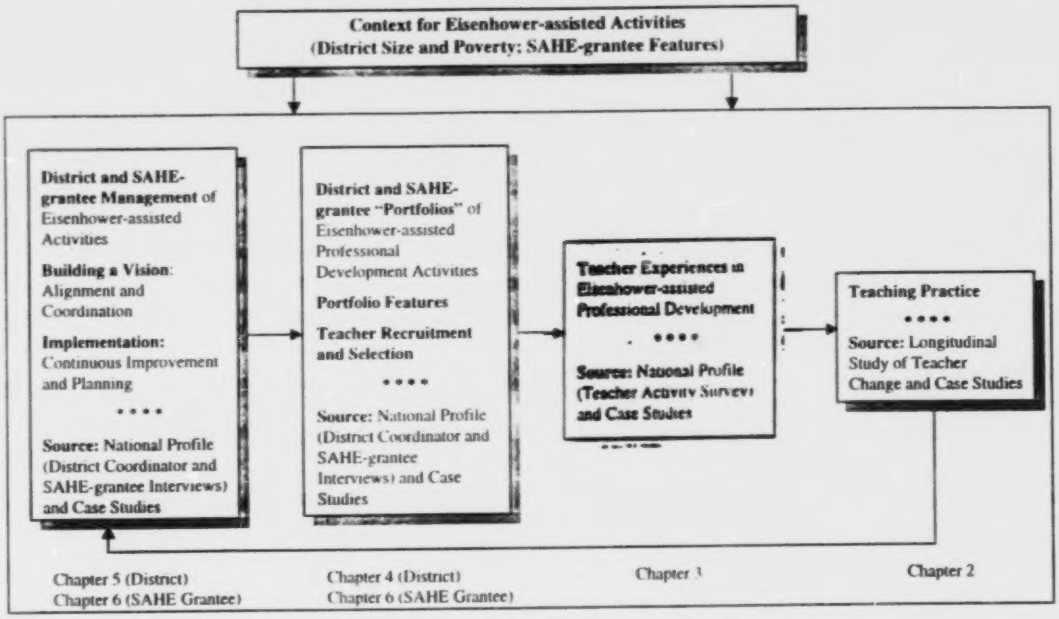
The Eisenhower Program also places an emphasis on providing professional development to teachers in Title I schools. The legislation provides that LEAs and SEAs describe in their applications how activities will address the needs of teachers in Title I schools (Section 2205(b)(2)(E) and Section 2208(d)(1)(B)) and includes them in the needs assessment process (Section 2208(b)(2)).

In this chapter, we examine the extent to which Eisenhower-assisted activities meet these provisions of the legislation. We also examine the extent to which supported activities reflect the characteristics of high-quality professional development that have emerged in the literature. Finally, we report on the extent to which Eisenhower-assisted activities meet the standards that have been set in the performance indicators for the program established by the Department of Education, in compliance with the Government Performance and Results Act (GPRA).

Exhibit 3.0 shows where these topics fit into the framework of the entire report.

EXHIBIT 3.0

Conceptual Framework for This Evaluation


Context for Eisenhower-assisted Activities
(District Size and Poverty; SAHE-grantee Features)
District and SAHE-grantee Management of Eisenhower-assisted Activities
Building a Vision: Alignment and Coordination
Implementation: Continuous Improvement and Planning
• • • •
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
District and SAHE-grantee "Portfolios" of Eisenhower-assisted Professional Development Activities
Portfolio Features
Teacher Recruitment and Selection
• • • •
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
Teacher Experiences in Eisenhower-assisted Professional Development
• • • •
Source: National Profile (Teacher Activity Survey) and Case Studies
Teaching Practice
• • • •
Source: Longitudinal Study of Teacher Change and Case Studies
Chapter 5 (District)
Chapter 6 (SAHE Grantee)
Chapter 4 (District)
Chapter 6 (SAHE Grantee)
Chapter 3
Chapter 2

The purpose of this chapter is to identify features of professional development that might be appropriately incorporated in Eisenhower-assisted activities because they have been shown to be effective in improving teaching practice. To this end, we first describe the features of effective, high-quality professional development identified in the literature. Second, we present results from our study describing the extent to which Eisenhower-assisted activities reflect these features. Third, we use our data to assess the extent to which these features are related to teachers' reports of improvement in teaching practice. Our analyses have implications for federal legislation and regulations, which call for Eisenhower-assisted activities to have particular qualities and features. In effect, this study assesses the effectiveness and appropriateness of the current legislation's language and requirements, given our findings on the importance of particular characteristics of professional development. The framework that we use to model the features and impact of professional development is based on both the professional development literature and the analysis of our survey data.

High-quality Professional Development

Over the past decade, a considerable literature has emerged on professional development, teacher learning, and teacher change.[1] The research literature contains a mix of large- and small-scale studies, including intensive case studies of classroom teaching, evaluations of programs designed to improve teaching and learning, and surveys of teachers about their pre-service preparation and in-service professional development experiences.[2] In addition, there is a large literature describing "best practices" in professional development, drawing on expert experiences. Despite the size of the literature, however, relatively little systematic research has been conducted on the *effects* of professional development on improvements in teaching or on student outcomes.

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[1] See V. Richardson & Placier, in press, for a comprehensive review of the literature on teacher learning and professional development.

Although relatively little research has been conducted on the effects of alternative forms of professional development, the research that has been conducted, along with the experience of expert practitioners, provides some preliminary guidance about the characteristics of high-quality professional development. (See, in particular, Loucks-Horsley et al., 1998.) Recently, for example, the U.S. Department of Education, drawing on the literature on teachers and teacher learning, identified six features of "best practice" in professional development. According to the Department (1999b, p. 63), effective professional development:

- **Reflects an image of teaching and learning that embraces high standards for all students.** Those who provide professional development must have a clear image of effective classroom learning and teaching. Good professional development is grounded in approaches to teaching that enable all students to achieve high standards, and makes these approaches real and accessible.

- **Focuses on deepening teachers' knowledge of content and how students learn specific content.** Good professional development develops teachers' skill and knowledge regarding the disciplines that they teach and children's ways of learning at different ages and in different contexts. It is rigorous, relevant, and research-based.

- **Provides extended, in-depth learning opportunities for teachers.** Good professional development promotes learning through, among other things, modeling the methods to be used with students and showing how methods are adapted for different types of students. Like all good teaching, such experiences build on existing knowledge, immerse learners in stimulating processes, allow for teamwork, and spread out over time to permit learners to digest new ideas, try them out, and re-gather for critical feedback. Professional learning is embedded in the life of the school whenever appropriate.

- **Supports expanded roles for teachers as leaders and colleagues.** Good professional development provides opportunities for teachers to serve as mentors, peer coaches, leaders, designers, planners, and facilitators. Such roles encourage collegial relationships in a community of learners. These, in turn, could entail changes in allocations of authority, responsibility, and time in schools.

- **Links to an educational system's programs and standards.** To strengthen the effectiveness of schools, professional development should be linked to other federal, state or district initiatives. It should be tied to relevant curricula, assessments, and standards.

- **Is accountable for results.** Professional development should be regularly evaluated for its impact on teaching and learning, and evaluation results should be used to support continuous improvement.

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[2] See, for example, Cohen (1990) for a recent intensive case study of change in mathematics teaching; Carey and Frechtling (1997) for a program evaluation of exemplary professional activities in science; and U.S. Department of Education (1999a) for a national survey of teachers focused on teacher preparation and qualifications.

Similar characteristics appear in other recent examinations of mathematics and science teaching. For example, James Hiebert, in a review of the research on mathematics teaching and learning conducted for the National Council of Teachers of Mathematics, calls attention to the importance of high standards, content focus, and in-depth learning opportunities for teachers, although he uses somewhat different language. According to Hiebert,

> Research on teacher learning shows that fruitful opportunities to learn new teaching methods share several core features: (a) ongoing (measured in years) collaboration of teachers for purposes of planning with (b) the explicit goal of improving students' achievement of clear learning goals, (c) anchored by attention to students' thinking, the curriculum, and pedagogy, with (d) access to alternative ideas and methods and opportunities to observe these in action and to reflect on the reasons for their effectiveness… (1999, p.15).

Although lists of characteristics such as these commonly appear in the literature on effective professional development, there is little direct evidence on the extent to which these characteristics are related to positive outcomes for teachers and students. Some studies conducted over the past decade suggest that professional development experiences that share all or most of these characteristics can have a substantial, positive influence on teachers' classroom practice and student achievement.[3] Several recent studies have begun to examine the relative importance of specific dimensions or characteristics of professional development. For example, a number of recent studies suggest that the intensity or duration of professional development is related to the depth of teacher change (Shields, Marsh, & Adelman, 1998; Weiss et al., 1998). Furthermore, there is some indication that professional development that focuses on specific mathematics and science content and the ways students learn such content is especially helpful, particularly for instruction designed to improve students' conceptual understanding (Cohen & Hill, 1998; Fennema et al., 1996). However, few studies have explicitly compared the effects of different forms of professional development on teaching and learning.[4]

Thus, there is a clear need for new, systematic research on the effectiveness of alternative strategies for professional development. The National Research Council, for example, in a review of recent research on the cognitive sciences, teaching, and learning, argues that

> Research studies are needed to determine the efficacy of various types of professional development activities, including pre-service and in-service seminars, workshops, and summer institutes. Studies should include professional development activities that are extended over time and across broad teacher learning communities in order to identify the processes and mechanisms that contribute to the development of teachers' learning communities (Bransford et al., 1999, p. 240).

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[3] See, for example, Fennema et al. (1996), an experimental study examining the effects of Cognitively Guided Instruction, an intervention in elementary school mathematics; Wilson and Ball (1991), an intensive case study of two teachers who participated in the Summer Math program; and Cohen and Hill (1998), which describes the relationship between participation in professional development, teaching practice, and student achievement, using survey data from California. See Kennedy (1998) for a review of available randomized studies examining the effects of teacher professional development on student achievement in mathematics and science. See Shields, Marsh, and Adelman (1998) for a recent examination of the effects of the NSF SSIs on classroom practice in mathematics and science; and Weiss et al. (1998) for an examination of the effects of the NSF LSCs.

[4] Kennedy (1998) and Cohen and Hill (1998) are among the few examples of studies that compare the relative effectiveness of different forms of professional development. Both studies conclude that professional development focused on the teaching and learning of specific mathematics and science content is more effective than more general professional development.

We designed the evaluation of Eisenhower-assisted professional development activities to enable us to examine the relationship between features of professional development that have been identified in the literature and change in teachers' knowledge and skills and classroom teaching practices, as reported by teachers. We integrated and operationalized the ideas in the literature on "best practices" in professional development to create a set of measures or scales describing the characteristics of Eisenhower-assisted activities.

In our analysis of the characteristics of high-quality professional development, we begin by focusing on what we term "structural features." These are characteristics of the structure or design of a professional development activity. We focus in particular on three structural features:

- The form or organization of the activity—that is, whether the activity is organized as a **reform type**, such as a study group, teacher network, mentoring, committee or task force, internship, individual research project, or teacher research center, in contrast to a traditional workshop or conference;
- the **duration** of the activity, including the total number of contact hours that participants are expected to spend in the activity, as well as the span of time over which the activity takes place; and
- the degree to which the activity emphasizes the **collective participation** of groups of teachers from the same school, department, or grade level, as opposed to the participation of individual teachers from many schools.

In addition to these structural features, we focus on three dimensions of the substance or core of the professional development experience. We examine three "core features":

- the degree to which the activity has a **content focus—**that is, the degree to which the activity is focused on improving and deepening teachers' content knowledge in mathematics and science;
- the extent to which the activity offers opportunities for **active learning**, such as opportunities for teachers to become actively engaged in the meaningful analysis of teaching and learning; for example, by reviewing student work or obtaining feedback on their teaching; and
- the degree to which the activity promotes **coherence** in teachers' professional development, by incorporating experiences that are consistent with teachers' goals, aligned with state standards and assessments, and encouraging of continuing professional communication among teachers.

Through our study of the literature and the analysis of our survey data, we have formulated a model characterizing the relationships between the quality of professional development, defined by the structural and core features, and their role in improving teacher outcomes. In this model, the three structural features—type, duration, and collective participation—are conditions that enable or facilitate desire core features of professional development. That is, they set the parameters or context within which teacher learning takes place. The three core features of the professional development activity—content focus, active learning, and coherence—are factors that characterize the processes that occur during a professional development experience. By focusing on specific mathematics and science content, by engaging teachers in active work, and by fostering a coherent set of learning experiences, we hypothesize that a professional development activity is likely to enhance the knowledge and skills and improve the classroom teaching practice of participating teachers. This, of course, serves the ultimate goal of improved student learning.

Data Sources

For the analyses in this chapter, we use information from the Teacher Activity Survey conducted as part of the evaluation. In the spring, summer, and fall of 1998, we surveyed a nationally representative sample of teachers who had attended Eisenhower-assisted activities over the period from July 1 through December 31, 1997.[5] We carried out the survey by drawing a national probability sample of districts and SAHE grantees. SAHE grantees include institutions of higher education (IHEs) such as universities, four-year colleges, or two-year colleges, and not-for-profits (NPOs), which are organizations such as zoos, museums, and libraries. Districts were sampled in proportion to the number of teachers in the district, and SAHE grantees were sampled in proportion to the size of their Eisenhower grant, based on the logic that SAHE grantees with larger grants would serve larger numbers of teachers. For each district and SAHE grantees drawn into the sample, we collected a complete list of all professional development activities conducted with Eisenhower funds over the period from July through December, 1997. We then drew a sample of two activities in each district or SAHE grantee, with the probability of an activity being selected in proportion to the number of teachers attending the activity. We then randomly subsampled two teachers who attended each activity. We received responses from 1,027 teachers, representing activities supported by Eisenhower funds in 358 districts and SAHE grantees. This produced an overall teacher response rate of 72 percent.[6]

The survey asked each teacher to provide detailed information about the *specific Eisenhower-assisted professional development activity* that we drew in our sampling process and that led the teacher to be selected for our sample. Responses are self-reports of teacher experiences and behavior.[7]

In discussing the structural features, quality, and outcomes of Eisenhower-assisted professional development in the chapter, we also include information from our In-Depth Case Studies, where appropriate. The case study data we present include information from six exploratory case studies that we conducted in the spring of 1997; and case studies of ten districts, two from each of five states, that we conducted during the 1997-1998 school year. We chose sites to allow variation according to efforts in state-level reform, the district's approach to professional development, and demographic and geographic characteristics.[8]

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[5] The term "Eisenhower-assisted activities" reflects the fact that district Eisenhower funds can support professional development activities in a number of ways. Eisenhower funds may be used to support all costs associated with activities, provided that these activities are allowed in the legislation (See Section 2210). Alternatively, Eisenhower funds may pay for only some of the allowable costs associated with an activity. This is a common occurrence, since the legislation encourages cost sharing of Eisenhower-assisted professional development activities with those funded by other programs (Section 2209).

[6] See Appendix A for a more complete discussion of the sampling plan for Teacher Activity Survey. All parameter estimates reported in the chapter incorporate weights reflecting the sampling plan. Reported p-values and the standard errors on which they are based, however, do not reflect the clustering, stratification, and variance in weights incorporated in the design. Analyses that take these elements of the complex sample design into account have been carried out, and the results are nearly identical to those reported in the chapter.

[7] The study was designed to maximize our capacity to provide a national description of Eisenhower-assisted activities and to assess the relationship between characteristics of activities and teachers' self-reported change in knowledge and skills and teaching practices. The study was not designed to allow us to examine the relationship between professional development and student achievement.

Organization of Chapter

In the sections that follow, we draw on our national sample of teachers, supplemented with data from the case studies, to examine the extent to which Eisenhower-assisted activities incorporate practices that reflect high-quality, in terms of the three structural features and the three core features of professional development.[9] Then, we use the data to examine the relative strength of the relationship between these quality features and teachers' reported improvement in knowledge and skills and teaching practices.[10]

In many of the exhibits in this chapter, we contrast teachers' experiences in district and SAHE-grantee activities. These two components of the program operate in somewhat different organizational contexts. In particular, as we discuss in more detail in chapters 4, 5, and 6, districts receive Eisenhower funds through an allocation formula, while SAHE grantees compete for funds. In addition, districts generally offer a range of Eisenhower-assisted activities serving a relatively large number of teachers, while SAHE grantees tend to offer a few activities focused on a small number of teachers. As we discuss further in later chapters, these differences in organizational context may help explain differences in teacher experiences in these two components of the program.

This chapter is organized in five sections. The first section examines the structural features of Eisenhower-assisted professional development activities, and the second examines the core features of teachers' professional development experiences in the activities in which they participated. The third section examines the extent to which teachers report that participation enhanced their knowledge and skills and improved their teaching practices, and the fourth examines the relationship between structural features, core features, and teachers' reported enhancement of knowledge, skills, and teaching practices. The fifth section examines the extent to which teachers in Eisenhower-assisted activities teach in high-poverty schools, and the final section summarizes our evidence from participating teachers and draws some initial conclusions about the Eisenhower program.

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[8] See Appendix B for a more complete discussion of the design of the In-Depth Case Studies.

[9] Results for some analyses reported in this chapter were reported earlier in U.S. Department of Education (1999b). The earlier results differ from results in this report because they were preliminary, unweighted, and did not include the full sample of teachers and districts. Results are considered to be statistically significant if the p-value is .05 or smaller.

[10] The survey results in this chapter are based on teachers' self-reports on change in knowledge, skills, and teaching practices. We are also collecting longitudinal data on a sample of teachers as part of the evaluation. These longitudinal data will provide stronger evidence of change in classroom teaching, and they will permit us to test the relationships that we discuss in this chapter. Analyses of the longitudinal data will appear in the third evaluation report, scheduled to be available in the spring of 2000.

STRUCTURAL FEATURES

Section Findings

- *Most teachers who participate in Eisenhower-assisted activities report that the activities take the form of workshops or conferences, for both districts and SAHE grantees; but some teachers report participating in reform types of activities, such as study groups, mentoring, or networks.*

- *Activities supported under the SAHE component of the program are of substantial duration, often lasting more than 80 hours and spanning a period of several months or more. Activities supported under the district component tend to be of shorter duration, although the duration appears to have increased since the previous Eisenhower evaluation.*

- *Although some Eisenhower-assisted activities are designed for groups of teachers from the same school, department, or grade level, most are designed for individual teachers*

While the authorizing legislation for the Eisenhower program does not specify the structure of supported activities in detail, the language included in the legislation nevertheless has important implications for the structure. In particular, the legislation includes language on both duration and collective participation, two of the three structural features on which we focus. With respect to duration, the legislation includes an intent to support professional development that "is of sufficient intensity and duration to have a positive and lasting effect on the teacher's performance in the classroom" (Section 2002(2)(E)). Although the legislation does not specify a required minimum duration, supported activities should be long enough to have "lasting effects."

In addition, the legislation includes language pertaining to the third structural feature—the extent to which activities encourage the collective participation of groups of teachers from the same school, department, or grade level. The legislation stipulates that LEAs should use at least 80 percent of Eisenhower funds for professional development for staff of "individual schools" that "is determined by such teachers and staff" and "to the extent practicable, takes place at the individual school site" (Section 2210(a)(1)(A)(B)). The law also suggests that funds may be used for "professional development for teams of teachers" (Section 2210(b)(3)(A)). These provisions, taken together, appear to encourage activities that are designed for collective participation.

In the paragraphs that follow, we examine the three structural features of Eisenhower-assisted professional development activities in more detail, relying on our data from a nationally representative sample of teachers who participated in Eisenhower-assisted activities during the 1997-98 year. We begin by examining the type or organizational form; we then consider the duration, and then the extent to which supported activities encourage collective participation.

Type of Activity

Undoubtedly the most common type or form of professional development, and the form most criticized in the literature, is the "workshop." A workshop is a structured approach to professional development that occurs outside the teacher's own classroom. It generally involves a leader or leaders with special expertise and participants who attend sessions at scheduled times—often after school, on the weekend, or during the summer (Loucks-Horsley et al., 1998, pp. 42-43). Institutes, courses, and conferences are other traditional forms of professional development that share many of the features of workshops, in that they tend to take place outside of the teacher's school or classroom; they involve a leader or leaders with special expertise, and participants who attend at scheduled times.

While traditional forms of professional development, such as workshops, institutes, courses, and conferences, are quite common, they are widely criticized as being ineffective in providing teachers with sufficient time, activities, and content necessary for increasing teacher's knowledge and fostering meaningful changes in their classroom practice (Loucks-Horsley et al., 1998). As a result, there is growing interest in other "reform" types of professional development, such as study groups or mentoring and coaching. These reform types differ from traditional professional development in several respects. In particular, reform activities often take place during the regular school day. In fact, some reform activities, such as mentoring and coaching, take place, at least in part, during the process of classroom instruction or during regularly scheduled teacher planning time. By locating opportunities for professional development as part of a teacher's regular work day, reform types of professional development may be more likely than traditional forms to make connections with classroom teaching, and they may be easier to sustain over time.

In addition, reform types of activities may be more responsive to how teachers learn (Ball, 1996), and may have more of an influence on changing teaching practice (Darling-Hammond, 1995; 1996; Hargreaves & Fullan, 1992; Little, 1993; Richardson, 1994; Sparks & Loucks-Horsley, 1989; Stiles, Loucks-Horsley, & Hewson, 1996). Further, Darling-Hammond argues that these activities may be more responsive to teachers' needs and goals:

> Some schools have begun to create new models of induction and ongoing professional development for teachers and principals. They feature mentoring for beginners and veterans, peer observation and coaching, local study groups and networks for developing teaching within specific subject matter areas (like the National Writing Project or the Urban Mathematics Collaboratives), teacher academies that offer ongoing seminars and courses of study tied to practice, and school-university partnerships that sponsor collaborative research, interschool visitations, and a variety of formal and informal learning opportunities developed in response to teachers' and principals' felt needs (Darling-Hammond, 1997b, p. 325).

In our survey of teachers, we asked each teacher to describe the specified Eisenhower-assisted activity in which the teacher participated, and, as part of the description, we asked the teacher to specify the *type* of activity, using the following set of categories:[11]

- *Within-district workshops or institutes*, focused on a specific topic, provided by or within the district.
- *Courses for college credit.*
- *Out-of-district workshops and institutes*, focused on a specific topic, provided outside of the district.

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[11] The categories draw in part on Loucks-Horsley et al. (1998).

- *Out-of-district conferences*, provided by professional organizations, regional centers, the state department of education, etc.
- *Teacher study groups* that meet regularly, in face-to-face meetings, to further teacher knowledge in their disciplines or of pedagogical approaches.
- *Teacher collaboratives or networks*, connecting teachers regionally, state-wide, nationally, or internationally (this does not include activities described in the first three bullets).
- *Committees or task forces* focusing on curriculum, instruction, or student assessment.
- *Receiving mentoring, coaching, lead teaching, or observation*, in a one-on-one situation, usually in the classroom.
- *Immersion or internship activities*, in which a teacher spends a concentrated period of time working in a lab or industrial setting with professionals in his or her subject area.
- *Teacher resource centers*, which provide professional development materials and are staffed by a lead or resource teacher.

The first four types of activities (within-district workshops, courses for college credit, out-of-district workshops, and out-of-district conferences) are traditional in form; the remaining types of activities (teacher study groups, teacher collaborative or networks, committees, mentoring, internships, and resource centers) are reform activities.[12]

Exhibit 3.1, below, displays information from the teacher survey on the types of professional development activities supported by Eisenhower funds. The data indicate that most Eisenhower-assisted activities are traditional in form. Overall, 79 percent of teachers participating in district Eisenhower-assisted activities participated in traditional types of activities, including 52 percent in in-district workshops, 4 percent in college courses, 15 percent in out-of-district workshops or institutes, and 8 percent in conferences. Similarly, 74 percent of teachers participating in SAHE-grantee activities participated in traditional types. Some teachers report that the activities in which they participated were reform types, including collaboratives and networks, internships, mentoring, resource centers, committees and task forces, and study groups, but the overall percent of teachers participating in reform activities is relatively small.

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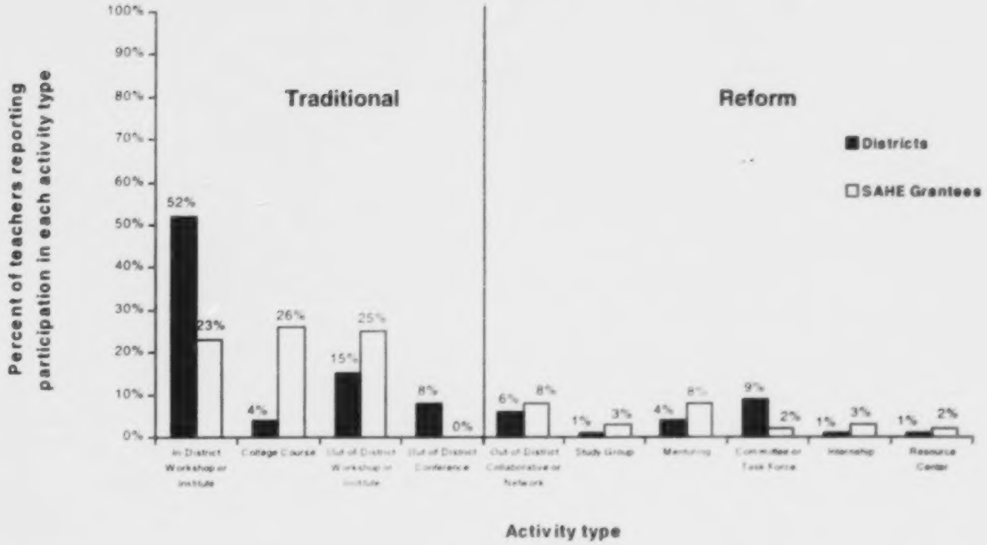
[12] The survey included a final category, "other organized forms of professional development," and asked the teacher to describe the form. We reclassified all responses into one of the 10 forms listed.

EXHIBIT 3.1

Percent of Teachers Reporting Participation in Traditional and Reform Types of Eisenhower-assisted Professional Development Activities (District n=775, SAHE Grantee n=244)[13]



Source: Mail Survey of Teachers Participating in Eisenhower supported Professional Development Activities, 1998
How to read this exhibit: The first bar shows that 52 percent of the teachers who participated in district activities report that they attended an in-district workshop or institute. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

About 22 percent of teachers participating in district activities and 26 percent of teachers participating in SAHE-grantee activities are in reform types of activities, including collaboratives and networks, mentoring, and study groups. The percent of teachers in such activities appears to have risen since the previous evaluation of the Eisenhower program, conducted in 1988-89 (Knapp et al., 1991). Nevertheless, workshops and other traditional forms continue to be the predominate types of professional development supported with Eisenhower funds.[14] In Chapters 4, 5, and 6, we explore some of the reasons for the continued reliance on traditional types of learning opportunities.

The type of an activity may set the context for many other features of the activity's structure and substance. Because reform activities such as study groups and mentoring often take place during the regular school day, they may enable activities of longer duration than traditional activities; and they may make it easier to encourage the collective participation of groups of teachers from the same school or department. Given the potential importance of activity type as a key structural feature, we contrast traditional and reform activities in reporting our results throughout the chapter.

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[13] Due to missing data caused by teacher nonresponse to particular survey questions, the number of teacher responses varies across survey items.

[14] The reported results concern the percent of teachers in reform activities. The percent of Eisenhower *funds* spent on reform activities may be higher, if reform activities cost more per teacher than traditional activities.

Duration of Activity

Almost all of the recent literature on teacher learning and professional development calls for professional development that is sustained over time. The duration of professional development activities is expected to be important for two reasons. First, longer activities are more likely to provide an opportunity for in-depth discussion of mathematics and science content, student conceptions and misconceptions, and pedagogical strategies. Second, activities that extend over time are more likely to allow teachers to try out new practices in the classroom and obtain feedback on their teaching.

Project Science, an Eisenhower-assisted professional development activity in Middle City, Wisconsin, illustrates an activity that extends throughout a full year. The goal of Project Science is to involve teams of teachers from different schools in establishing the capacity to develop and administer performance assessments. The project included an institute in the summer, as well as two-hour monthly meetings over the school year, from September until May. In addition, during the year, school networking sessions focused on curriculum and learning issues and on the development of assessment instruments. During these meetings, teachers shared progress, difficulties, ideas, issues, and needs.

To develop a national estimate of the duration of professional development supported by the Eisenhower program, we included items on our Teacher Activity Survey asking about two aspects of duration: the total number of *contact hours* spent in the professional development activity, including all components of the activity that were held during the one-year period from July 1, 1997, through June 30, 1998; and the *span* or period of time, in days, weeks, and months, over which the activity was spread.[15] Exhibit 3.2 displays our results for contact hours. The results indicate that Eisenhower-assisted activities vary widely in the amount of time involved.

In the graph, each dot represents one teacher. If only one teacher in our sample attended an activity of a particular duration (e.g., 140 hours), the teacher appears as a single dot. If more than one teacher in our sample attended an activity of a particular duration (e.g., 20 hours), the teachers are displayed in a horizontal line. The length of the line is proportional to the number of teachers. For example, the graph indicates that more district teachers attended activities lasting 20 hours than lasting 30 hours.

The number appearing on the right of each distribution is the average number of hours of instruction for that particular group of teachers. Overall, district activities last an average of 25 hours. SAHE-grantee activities last considerably longer than district activities. The average length of SAHE-grantee activities is 51 hours—nearly twice as long as district activities.

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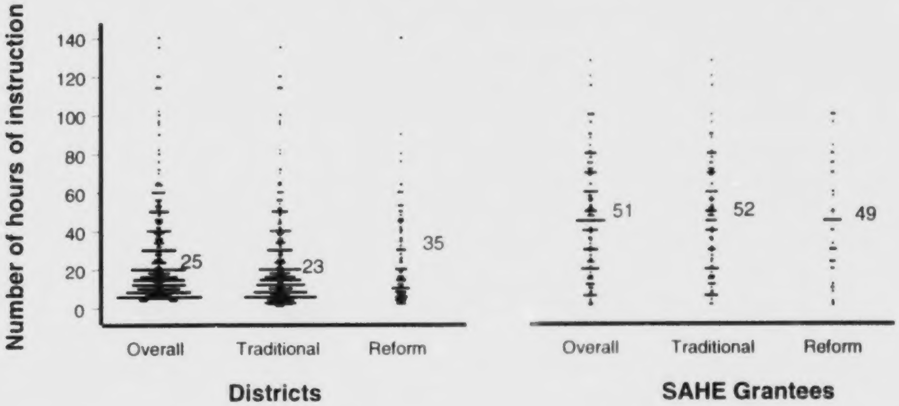
[15] Teachers who completed their surveys before the end of the 1997-98 school year were asked to estimate the number of additional hours the activity would last during the remaining months of the school year.

EXHIBIT 3.2

Contact Hours Provided by Eisenhower-assisted Professional Development Activities, as Reported by Teachers (District n=767, SAHE Grantee n=244)



Source: Mail Survey of Teachers Participating in Eisenhower supported Professional Development Activities, 1998.
How to read this exhibit: The first column (District "Overall") shows that on average, teachers who participated in district activities reported that they were engaged in the activity for 25 hours. Each dot represents one teacher. If more than one teacher reported the same number of hours, the teachers are displayed in a horizontal line with length proportional to the number of teachers. Each column represents the distribution for a particular group of teachers. The number to the right of each column is the mean.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

While district activities tend to be shorter than SAHE-grantee activities, our results indicate that the median duration of district Eisenhower-assisted activities has approximately doubled since the last evaluation of the program was conducted in 1988-89. According to the 1988-89 evaluation, in the median district, activities supported by Eisenhower funds lasted an average of 6 hours, which is less than half of the current median of 15 hours.[16]

As expected, at least for districts, reform activities last longer than traditional types: the average length of reform activities is 35 hours, compared with 23 hours for traditional activities. For SAHE grantees, however, there is essentially no difference in length between traditional and reform types. In part, this may reflect the fact that many traditional SAHE-grantee activities are college courses, and college courses, at a minimum, generally last at least three hours a week for ten weeks. But courses do not fully account for the substantial length of traditional SAHE-grantee activities; workshops offered by grantees tend to be longer than those offered by districts.

One way to assess the adequacy of the number of contact hours of professional development provided by typical Eisenhower-assisted activities is to compare our results with the hours provided in widely known exemplary professional development activities in mathematics and science. One frequently cited professional development program is Cognitively Guided Instruction (CGI), which focuses on improving teachers' understanding of student learning in elementary arithmetic

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[16] The 1988-89 evaluation collected data on duration from districts rather than teachers, so a comparison of results from the 1988-89 and the current evaluation should be interpreted as providing an indication of the general magnitude of the change rather than a precise numerical estimate. See Knapp et al. (1991, p. 109).

(Carpenter et al., 1989). The basis of the intervention is an 80-hour summer institute, with modest year-long follow-up. Fennema et al. (1996) have conducted a number of careful studies that show that the program has had a substantial positive influence on participating teachers' teaching practices and on student achievement as measured on tests of mathematical reasoning and problem solving. In a recent study of exemplary professional development activities in the sciences supported by NSF, ED, and other federal agencies, the activities involved lasted from a few days to eight weeks (Carey and Frechtling, 1997). Other studies include Cobb et al. (1991) and Wood and Sellers (1996), who show positive effects on student achievement in mathematical reasoning, based on a professional development activity lasting about 150 hours; and the Ohio State Systemic Initiative (Project Discovery), which produced positive changes in teaching practice, based on an intensive six-week (240 hours) summer program (Supovitz, 1996).

Many SAHE-grantee professional development activities have a duration (in hours) comparable to CGI, and this suggests that, at least potentially, these activities are sufficiently intensive to help teachers achieve worthwhile change in teaching practice. Typically, most district Eisenhower-assisted activities are substantially shorter than exemplary activities in mathematics and science.

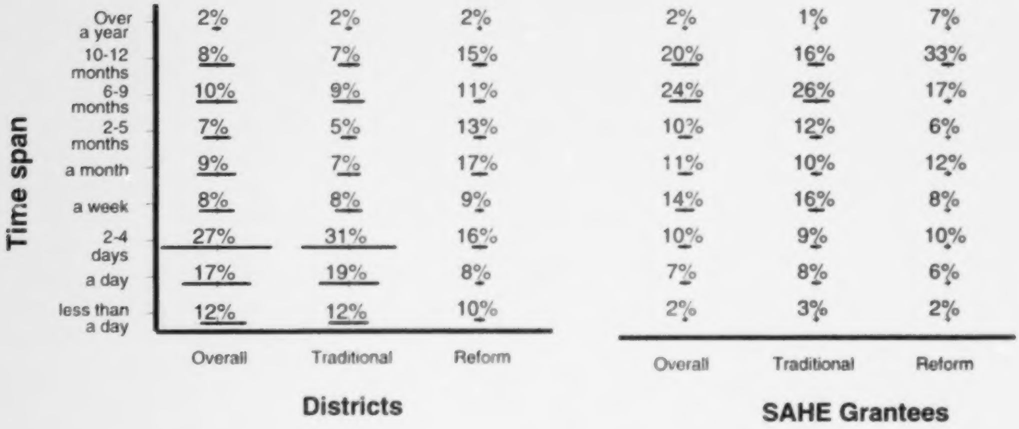
In addition to asking about the hours of professional development provided, we also asked about the span of the activity, or the period over which the sessions or components of the activity were spread. Although hours and span are correlated, they measure different aspects of duration, both of which are important in providing teachers with sufficient opportunities for in-depth study, interaction, and reflection.

The results, displayed in Exhibit 3.3, show that some Eisenhower-assisted activities take place over a one-day period, while others extend over a period longer than one month and some extend six months or more. The data indicate that, overall, about 27 percent of teachers in district Eisenhower-assisted activities report a span more than one month, while 56 percent of teachers in IHE activities report a span more than one month. As anticipated, there is a substantial difference in span between traditional and reform types. For districts, 23 percent of teachers in traditional activities report that these activities last more than a month, while 41 percent of reform activities exceed one month. Similarly, for IHE/NPOs, 55 percent of teachers in traditional activities report that they last longer than a month, while 73 percent of teachers in reform activities report that they exceed one month.

Many Eisenhower-assisted activities take place over a very short span of time. Overall, 56 percent of district activities span a period of less than one week (less than a day through four days) and 19 percent of SAHE-grantee activities span a period of less than one week.

EXHIBIT 3.3

Time Span of Eisenhower-assisted Activities, as Reported by Teachers (District n=766, SAHE Grantee n=244)



Source: Mail Survey of Teachers Participating in Eisenhower supported Professional Development Activities, 1998.
How to read this exhibit: The first column shows that 2 percent of the teachers who participated in district activities were engaged in the activity over more than a year. Each dot represents one teacher. If more than one teacher reported the same span, the teachers are displayed in a horizontal line with length proportional to the number of teachers. Each column represents the distribution for a particular group of teachers. The number on the top of each line is the percent of teachers participating in the corresponding time span.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

Collective Participation

There is a growing interest in professional development that is designed for groups of teachers from the same school, department, or grade level. Although professional development designed for groups of teachers is sometimes thought to reinforce the status quo, it also has a number of potential advantages. First, teachers who work together are more likely to have the opportunity to discuss concepts, skills, and problems that arise during their professional development experiences. Second, teachers who are from the same school, department, or grade are likely to share common curriculum materials, course offerings, and assessment requirements. By engaging in joint professional development, they may be able to integrate what they learn with other aspects of their instructional context.

Finally, by focusing on a group of teachers from the same school, professional development may help sustain changes in practice over time, as some teachers leave the school's teaching force and other new teachers join the faculty. Professional development may help contribute to a shared professional culture, in which teachers in a school or teachers who teach the same grade or subject develop a common understanding of instructional goals, methods, problems, and solutions. (See, for example, Talbert & McLaughlin, 1993.) Collective participation in the same activity can provide a forum for debate and improving understanding, which increases teachers' capacity to grow (Ball, 1996).

Knapp, in a 1997 review of the effects of systemic reform in mathematics and science, gives particular attention to the importance of viewing change in classroom teaching as a problem of *organizational* as well as *individual* learning:

> Where and how does individual learning about challenging science instruction, for example, get deposited in organizational routines? How does a culture supportive of science instruction take root in a school and sustain itself beyond the original cast of characters who helped set in motion a shift in organizational culture? (p. 258)

Little research is available on the effects of collective approaches to professional development, but there is some evidence that it can be effective in changing teaching practice. Newmann and associates, in a study of 24 "restructuring schools," note that, in the more successful schools:

> Professional development tended to be focused on groups of teachers within the school or the faculty as a whole. Making use of internal as well as external expertise, staff development activities took advantage of local skills and sharing of effective practice. Including internal experts as staff developers reinforced teachers' sense of commitment to their school's goals (Newmann et al., 1996).

Maple City, Ohio, one of our case-study districts, illustrates an Eisenhower-assisted activity that encouraged collective participation similar in form to the learning opportunities Newmann et al. describe. The district offers several subject-specific, half- to full-day Eisenhower-assisted inservices by grade level. The inservices are led by the math and science coordinators or by someone outside the district. At the inservices, teachers share information and instructional practices, review instructional materials, and engage in activities to improve their skills. They are hands-on and support an integrated approach to instruction, including an emphasis on bridging instruction across contiguous grade levels. Teacher-Leaders help teachers implement new practices by serving as mentors in their classrooms. They plan with them, team-teach, and gather necessary supplies. In addition, the district provides teachers with time during the school day to get together and discuss what works and what does not.

To assess the prevalence of collective participation in Eisenhower-assisted activities, we asked each teacher in our national sample to indicate whether the activity in which the teacher participated was designed for all teachers in a school or set of schools, or all teachers in the teacher's department or grade level.[17] The results, displayed in Exhibit 3.4, show that about 20 percent of teachers in district Eisenhower activities report that the activity was designed for all teachers in a department or grade level, and 19 percent report that the activity was for all teachers in a school. Fewer teachers in SAHE-grantee activities report either form of collective participation: seven percent indicate that their activity was designed for all teachers in a school, and 11 percent for all teachers in a department or grade level.

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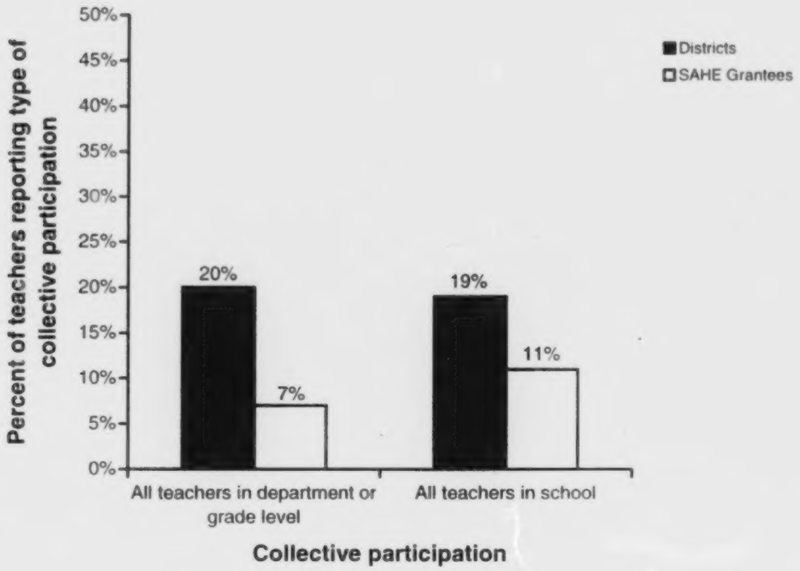
[17] Teachers were also given the following options: teachers as individuals, teachers as representatives of their departments, grade level, or schools, and other configurations. Teachers could check all that applied.

EXHIBIT 3.4

Percent of Teachers Reporting School-level, and Department or Grade-level Participation in Eisenhower-assisted Professional Development Activities (District n=783, SAHE Grantee n=244)



Source: Mail Survey of Teachers Participating in Eisenhower supported Professional Development Activities, 1998.
How to read this exhibit: The first bar shows that 20 percent of the teachers who participated in district activities report that all teachers in department or grade-level groupings participated in the professional development activity. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

Because reform activities frequently occur during the school day, and often involve work in the classroom, we had anticipated that reform activities would be more likely to be designed to promote collective participation than traditional forms. Our data, however, show no difference between traditional and reform activities in collective participation, for either districts or IHE/NPOs. This result is consistent with data from some of our case sites. In several sites with mentors and coaches, for example, the mentors moved across schools to work with individual teachers. We also observed study groups whose membership crossed school and department boundaries.

By and large, most Eisenhower-assisted activities are designed for teachers as individuals. This pattern is consistent with other data on professional development, which shows that collective participation is relatively uncommon—indeed, less common overall than our data indicate is the case for Eisenhower-assisted activities. For example, according to Shields, Marsh, and Adelman (1998), very few State Systemic Initiatives (SSIs) have focused their professional development efforts on whole schools or departments, and those that did focused on just a few sites. As Shields, Marsh, and

Adelman argue, one reason for this may be the resources required: providing sustained, intensive professional development for all teachers in a school may require more resources than are available. Programs thus face a tradeoff between providing longer-term professional development for some teachers, or focusing on whole schools.[18]

Summary: Structural Characteristics

Overall, our data from a national sample of teachers who have attended Eisenhower-assisted activities show that most teachers participating in Eisenhower-assisted activities are in activities that are traditional in form, although about 20 percent of teachers in district activities and one-quarter of teachers in SAHE-grantee activities are in reform types, such as study groups and mentoring. In addition, our data indicate that Eisenhower-assisted activities supported through the SAHE component of the program are substantially longer in duration than activities supported under the district component of the program. Finally, most Eisenhower-assisted activities are focused on individual teachers, although about 20 percent of teachers in district activities report that activities are focused on whole schools or departments.

Our data can be used to provide evidence on one of the Department of Education's Performance Indicators established for the Eisenhower program. Indicator 3.2 focuses on the extent to which professional development supported by the program is *sustained* throughout the school year (see box). As shown in Exhibit 3.3, 20 percent of teachers participating in district activities are in activities that extend at least six months; and 46 percent of teachers participating in SAHE-grantee activities are in activities that extend beyond six months. If we use "at least six months" as the standard against which activities are to be assessed, then district activities do not yet meet the 35 percent standard set in the Indicator, while SAHE-grantee activities exceed the standard by a substantial amount.[19]

***Indicator 3.2* Sustained Professional Development.** By 1998, 35 percent of teachers participating in district-level Eisenhower-assisted activities will participate in activities that are a component of professional development that extends over the school year; by 2000, over 50 percent will.

In summary, then, on average, SAHE-grantee activities appear to share more of the structural features associated with high-quality professional development than do district activities. District activities on the average are shorter, but the average duration has increased substantially since the last evaluation was conducted. In the following section, we turn to the core features of the experiences that take place during Eisenhower-assisted activities.

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[18] One exception to this general pattern may be found in the recently established NSF Local Systemic Change program, which incorporates a requirement that all elementary teachers in the target area participate in at least 100 hours of professional development, and all secondary teachers participate in at least 130 hours (Weiss et al., 1998).

[19] The Indicator requires that activities "are a component of professional development that extends over the school year." It is possible that some short-term Eisenhower activities are linked to other activities, and these "sequences" of activities extend over the school year. If so, the percent of Eisenhower-assisted activities extending more than six months may understate the percent of activities that "are a component of professional development that extends over the school year."

CORE FEATURES

Section Findings

- *Many teachers participating in Eisenhower-assisted activities, especially SAHE-grantee activities, report that the activities place a major emphasis on deepening their content knowledge in mathematics and science.*

- *Most Eisenhower-assisted activities incorporate some form of active learning— for example, preparation of lesson plans and discussion of classroom implementation. Fewer activities involve other aspects of active learning—for example, observation of teaching and examination of student work.*

- *Eisenhower-assisted activities generally encourage a coherent process of teacher learning. Most teachers participating in Eisenhower-assisted activities report that the activities are consistent with their goals and aligned with state and district standards and assessments.*

In the previous section, we focused on three features of the structure of professional development activities that establish the setting in which professional development takes place: the type of activity, its duration, and opportunities for collective participation. In this section, we turn to the substance of the core experiences provided as the professional development activity unfolds.

The reauthorizing legislation for the Eisenhower program emphasizes the intent to support activities that are of "high quality," but it does not spell out the particular characteristics that high-quality professional development should have. However, some elements of quality are enumerated in the rationale and supporting statements accompanying the legislation. For example, in referring to the literature on professional development, Section 2001(4)(A) states that:

> professional development must be focused on teaching and learning in order to improve the opportunities of all students to achieve higher standards.

And Section 2001(4)(B), drawing on the literature, states that:

> effective professional development focuses on discipline-based knowledge and effective subject-specific pedagogical skills, involves teams of teachers, and, where appropriate, administrators and pupil services personnel, in a school and, through professional networks of teachers, and, where appropriate, teacher educators, administrators, pupil services personnel, and parents, is interactive and collaborative, motivates by its intrinsic content and relationship to practice, builds on experience and learning-by-doing, and becomes incorporated into the everyday life of the school.

In addition, the explicitly stated purpose of the law is to ensure that teachers have access to professional development that "reflects recent research on teaching and learning" and "includes strong academic content and pedagogical components" (Section 2002(2)(B)(C)).

In addition to the law, we have drawn on the literature to specify the dimensions of quality. In the discussion that follows, we examine three features in particular that the literature suggests may be related to improvements in teacher knowledge and skills, teaching practices, and student achievement. The first dimension concerns the extent to which Eisenhower-assisted activities focus on strong academic content; the second concerns the extent to which activities include opportunities for teachers to become actively engaged in learning new skills; and the third concerns the extent to which Eisenhower-assisted activities form part of a coherent, meaningful program of professional development that is consistent with teachers' goals and related to teachers' work.

While these three dimensions are not specifically identified in the legislation, they are broadly consistent with the purposes of the law. In particular, the Congressional findings and supporting statements for the law clearly encourage professional development that focuses on content ("discipline-based knowledge and effective subject-specific pedagogy"), that encourages active learning ("builds on experience and learning by doing"), and that encourages a coherent program of professional development ("becomes incorporated in the everyday life of the school") (Section 2001(4)(B)).

In the following sections, we consider each of these three core features in turn, drawing on our survey and case-study data to assess the extent to which Eisenhower-assisted activities reflect these central features of quality professional development.

Focusing on Content

Although there is a large literature on professional development, surprisingly little attention has been given to the composition and characteristics of professional development activities. In particular, little research has been conducted on the relative efficacy of professional development activities that focus on different types of knowledge, skills, and teaching practices. [20]

The available descriptive research suggests that the content covered during professional development activities varies along at least four dimensions. First, activities vary in the relative emphasis they give to the *content* teachers are expected to teach and the *teaching methods* teachers are expected to employ. Some activities are intended primarily to improve teachers' knowledge of subject-matter content; some are designed to improve general pedagogy or teaching practices, such as classroom management, lesson planning, or grouping methods; and some are intended to improve what Shulman (1987) has termed "pedagogical content knowledge" – teaching practices in specific content domains, such as the teaching of multi-digit addition in elementary mathematics or forces and motion in physics.

Activities also vary in the *specificity of the changes* in teaching practice that are encouraged. Some activities focus on helping teachers use particular curriculum materials (e.g., new textbooks, science kits, or curriculum replacement units) or prescribed teaching strategies (e.g., specific student questioning strategies). Others focus on general principles, giving less attention to specific curricula or strategies. (See Kennedy, 1998, for a discussion of this distinction.)

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[20] Not all professional development is focused on knowledge and skills. Some activities are designed to increase teachers' awareness of new practices rather than to increase knowledge and skills; others are designed to build or renew teachers' motivation and commitment to teaching, without necessarily changing teaching practices.

In addition, activities vary in the *goals for student learning* emphasized. Some activities emphasize helping teachers improve student performance in the basic skills—for example, memorizing facts and mastering procedural skills, such as long division or solving linear equations in one unknown. Other activities focus on helping teachers improve students' conceptual understanding—for example, the ability to explain the reasons behind a solution strategy.[21]

Finally, activities vary in the emphasis they give to the *ways students learn* particular subject matter. Some activities give considerable emphasis to improving teachers' understanding of how children learn, by focusing, for example, on common student preconceptions, misconceptions, and solution strategies in specific subject domains. Other activities focus primarily on new curricula or teaching methods, while giving little attention to the ways students learn.

Although there is little evidence on the relative effectiveness of professional development activities that focus on different types of knowledge, skills, and teaching practices, a small literature has begun to emerge focusing on these issues. In particular, an emerging body of work suggests that professional development that focuses on subject-matter content and how children learn it may be an especially important element in changing teaching practice (e.g., Ball & Cohen, in press; Corcoran, 1995). In part, researchers base this argument on the fact that many teachers lack strong content-specific teaching skills. Reynolds, for example, in a review of the knowledge base for elementary school teachers, concluded that "beginning teachers have surprisingly few content-specific pedagogical understandings" (1995, p. 214). And Rhine (1998), in a discussion of the role of research in teaching, pointed out that "[r]eform-minded teachers are hungry for continuing education that provides novel ways to address content" (p. 27).

A number of authors argue that professional development requires a dual focus on both knowledge of subject matter content and an understanding of how children learn specific content. Hiebert et al. (1996), for example, argue that teaching for understanding in mathematics requires two forms of knowledge:

> knowledge of the subject to select tasks that encourage students to wrestle with key ideas and knowledge of students' thinking to select tasks that link with students' experience and for which students can see the relevance of the ideas and skills they already possess (p. 16).

This point of view is bolstered by several recent studies of the effects of professional development on student achievement. Cohen and Hill (1998) conducted a study of mathematics teaching in California, based on data on teachers' professional development experiences and school-level data on student performance on a mathematics test administered statewide. They found that, controlling for the characteristics of students enrolled, average mathematics achievement was higher in schools in which teachers had participated in extensive professional development focusing on the teaching of specific mathematics content than in schools in which teachers had not. Participation in professional development focusing on general pedagogy, however, was not related to student achievement.

Kennedy (1998) found similar results in a review of well-designed experimental studies of the relationship between professional development and student achievement in mathematics and science, commissioned as part of this evaluation. The review found that, compared to more general professional development, professional development that focuses on specific content and how students learn has larger positive effects on student achievement outcomes, especially achievement in conceptual understanding.

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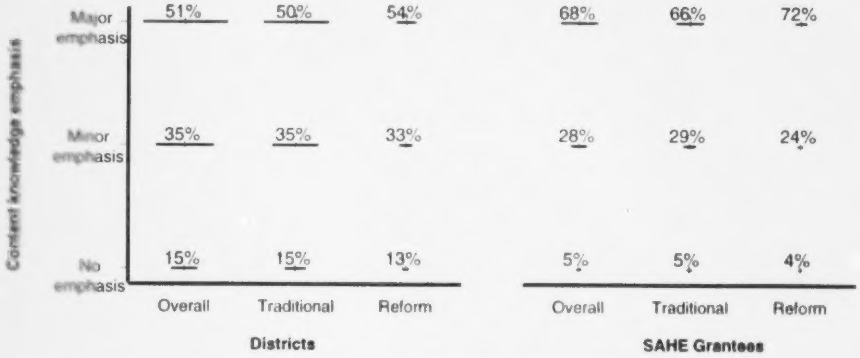
[21] See Chapter 2 for a discussion of these performance goals.

Based on this emerging evidence, we view the *degree of content focus* as a central dimension of high-quality professional development. To examine the content focus of Eisenhower-assisted activities, we asked each teacher in our national sample to indicate the degree of emphasis the activity in which the teacher participated gave to deepening content knowledge in mathematics and science, using a three-point scale (no emphasis=zero, minor emphasis=one, major emphasis=two).[22]

The results are reported in Exhibit 3.5. As can be seen, many teachers in both district and SAHE-grantee activities report a major emphasis on content in the activities in which they participated, although teachers in district activities report somewhat less focus on content than teachers in SAHE-grantee activities. Overall, 51 percent of teachers in district activities report a major emphasis on content and 35 percent report a minor emphasis. For SAHE-grantee activities, 68 percent of teachers report a major emphasis and 28 percent report a minor emphasis. There is no significant difference in content focus between traditional and reform activities.

EXHIBIT 3.5

Percent of Teachers Reporting a Major Emphasis on Mathematics and Science Content Knowledge in Eisenhower-assisted Professional Development Activities (District n=754, SAHE Grantee n=243)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first distribution shows that 51 percent of the teachers who participated in district activities report that a major emphasis was put on content knowledge in their activity. Each dot represents one teacher. As the number of teachers at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of teachers for that particular category. The number on the top of the distribution is the percent of teachers responding to the category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

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[22] We did not ask teachers about other aspects of content-focus—for example, the extent to which the activity emphasized how students learn specific content or the extent to which it focused on methods of teaching specific content. Items on these aspects of content focus are included in the third wave of the teacher longitudinal survey, for which results will be available in the fall of 1999.

Although our survey data do not tell us whether the content emphasized is of high quality, our data do indicate that a substantial proportion of Eisenhower-assisted activities are tied to subject-matter content. Given the growing literature and recent research emphasizing the potential relationship between content focus and student achievement, these results are encouraging.

Promoting Active Learning

A second core feature of professional development concerns the opportunities provided for teachers to become actively engaged in meaningful discussion, planning, and practice as part of the professional development activity. (See, for example, Lieberman, 1996; and Loucks-Horsley, Hewson, Love, & Stiles, 1998.) Opportunities for active learning can take a number of forms, including the opportunity to observe expert teachers and to be observed teaching; the opportunity to plan how new curriculum materials and new teaching methods will be used in the classroom; the opportunity to review student work in the topic areas being covered; and the opportunity to lead discussions and engage in written work.

Lieberman (1996) argues that, for teachers to change their teaching, they must have the opportunity to "talk, think, try out, and hone new practices" (p. 189). Darling-Hammond (1997b) has characterized professional development with characteristics such as "rich professional development." According to Darling-Hammond, rich professional development:

> is *centered around the critical activities of teaching and learning*—planning lessons, evaluating student work, developing curriculum—rather than around abstractions and generalities; it grows from *investigations of practice* through cases, questions, analysis, and criticism; and it is built on substantial *professional discourse* that fosters analysis and communication about practice and values in ways that build collegiality and standards of practice [emphasis in original] (p. 323).

The importance of engaging teachers in concrete tasks as a part of professional development is given some support in a recent study of 34 exemplary professional development activities in mathematics and science, supported by the National Science Foundation, the Department of Education, and other federal agencies (Carey & Frechtling, 1997). As part of an evaluation of these activities, teachers were surveyed about the degree to which the activities included the opportunity to plan how the concepts and materials would be used in the classroom, as well as the opportunity to engage in hands-on activities, challenging problem solving, and the development of curriculum units. Carey and Frechtling indicate that teachers who participated in activities that offered these opportunities reported more change in knowledge, skills, and teaching practices than teachers in activities that did not afford these opportunities.

In the following paragraphs, we examine the degree to which opportunities of this kind are provided in our national sample of Eisenhower-assisted activities. Although we do not have information on the extent to which a particular strategy was used in an activity nor whether it was used in conjunction with conceptual, in-depth learning, we do have information on the prevalence of several types of learning strategies. We focus in particular on four dimensions of active learning: observing and being observed teaching; planning for classroom implementation; reviewing student work; and presenting, leading, and writing.

Observing and Being Observed

One element of active learning is the opportunity for teachers to observe expert teachers and be observed teaching in their own classroom and obtain feedback. These opportunities can take a variety of forms. Videotaped lessons, for example, can offer participants an opportunity to observe lesson content, teaching strategies, and student learning. Teachers can visit each others' classrooms to observe lessons. Activity leaders, lead teachers, mentors, and coaches can observe classroom teachers and engage in reflective discussions about the goals of a lesson, the tasks employed, teaching strategies, and student learning.

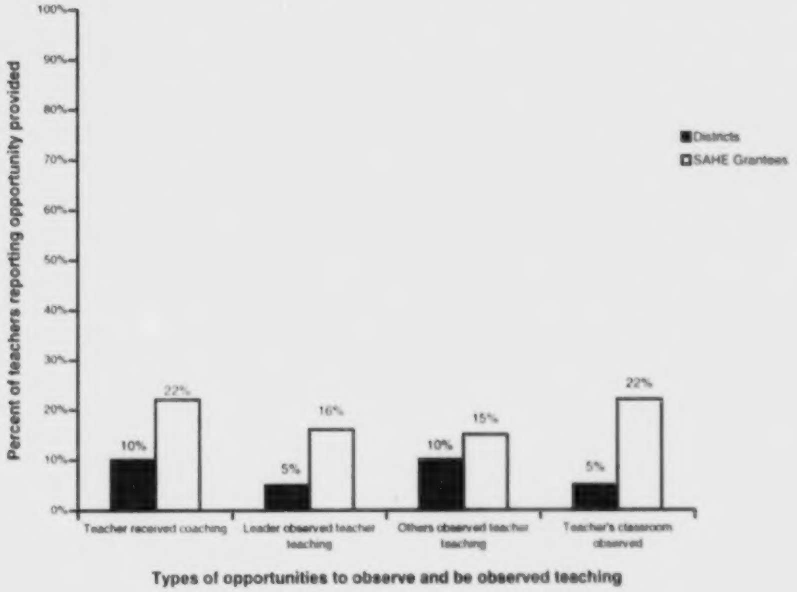
Eisenhower funds were used to support in-depth opportunities for observation in West City, Connecticut, one of our exploratory case sites. As part of the portfolio of activities offered with Eisenhower support in West City, two skilled in-house facilitators provide coaching and support for elementary teachers, including demonstration lessons and help with planning. Teachers who receive intensive coaching generally spend one to two hours per week in pre-lesson discussion, demonstration lessons, and post-lesson feedback.

To determine the frequency with which opportunities of this kind are provided as part of Eisenhower-assisted activities, we asked each teacher in our national sample how the activity helped the teacher use new skills in the classroom. In particular, we asked each teacher whether the teacher received coaching or mentoring in the classroom as part of the Eisenhower-assisted activity; whether the teacher's teaching was observed by the activity leader(s) and feedback was provided; and whether the teacher's teaching was observed by other participants and feedback was provided. We also asked whether the activity was evaluated in part based on an observation of the teacher's classroom.

The results, shown in Exhibit 3.6, indicate that relatively few teachers report opportunities to observe and be observed as part of Eisenhower-assisted activities, but, overall, SAHE-grantee activities provide more opportunities for classroom observation than do district activities. For example, 22 percent of teachers in SAHE-grantee activities report being coached in the classroom as part of the activities in which they participated, compared with 10 percent of teachers in district activities. Similar differences appear in the percentage of teachers who report being observed by the leader (16 versus five percent), who report being observed by other teachers (15 versus 10 percent), and who report that the activity was evaluated in part based on observation (22 versus five percent).

EXHIBIT 3.6

Percent of Teachers Reporting That They Had Opportunities to Observe or Be Observed Teaching in Eisenhower-assisted Professional Development Activities (District n=783, SAHE Grantee n=244)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first bar shows that 10 percent of the teachers who participated in district activities report that they had an opportunity to receive coaching or mentoring in the classroom. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

Planning Classroom Implementation

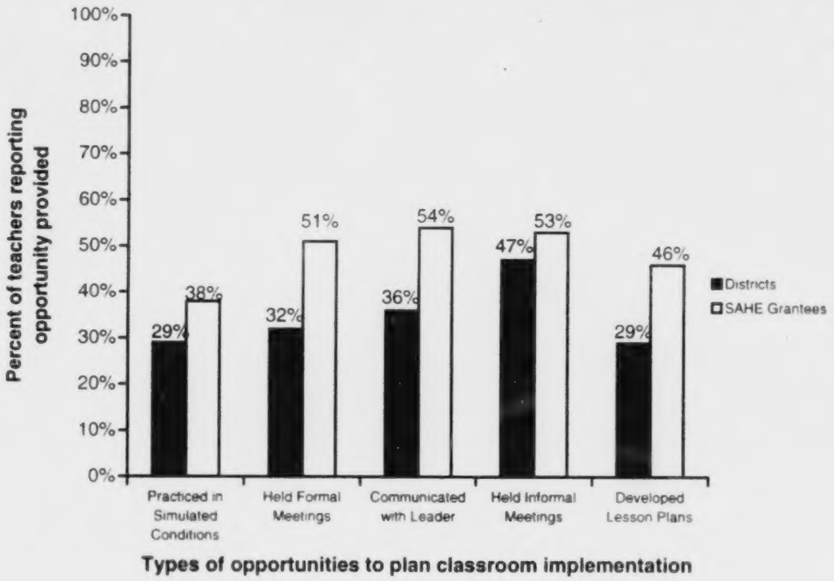
A second element of active learning involves the opportunity to link the ideas introduced during professional development experiences to the teaching context in which teachers work. The introduction of new approaches may have different implications depending on the curriculum in place in a teacher's school, the specific textbooks adopted in the teachers' classrooms, and the required assessments in the teachers' districts, as well as the characteristics of the students enrolled in the teachers' classrooms, including the material covered in previous grades and students' expectations for classroom instruction.

To assess the extent to which Eisenhower activities provided teachers with opportunities to plan classroom implementation, we asked each teacher in our national sample whether, as part of the activity in which the teacher participated, the teacher practiced under simulated conditions, with feedback; met formally with other activity participants to discuss classroom implementation; communicated with the leader(s) of the activity concerning classroom implementation; met informally with other participants to discuss classroom implementation; and developed curricula or lesson plans that other participants or the activity leader reviewed.

Exhibit 3.7 shows that opportunities to plan classroom implementation are a more common part of Eisenhower-assisted activities than opportunities to observe and be observed teaching. But, as in our results for observation, SAHE-grantee activities are more likely to provide opportunities for planning than are district activities. For example, 32 percent of teachers participating in district Eisenhower-assisted activities report that the activities in which they participated provided the opportunity to discuss classroom implementation, as do 51 percent of teachers in SAHE-grantee activities. Similarly, 36 percent of teachers in district activities report that the activity provided an opportunity to communicate with the leader about classroom implementation, as do 54 percent of teachers in IHE/NPO activities.

EXHIBIT 3.7

Percent of Teachers Reporting Opportunities to Plan Classroom Implementation in Eisenhower-assisted Professional Development Activities (District n=783. SAHE Grantee n=244)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first bar shows that 29 percent of the teachers who participated in district activities report that they had an opportunity to practice under simulated conditions. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

Reviewing Student Work

Another element of active learning is the opportunity to examine and review student work. By examining students' written responses to problems, for example, teachers may gain an understanding of students' preconceptions, misconceptions, and solution strategies (Schifter, 1996; Carpenter et al., 1989). And, by observing students' responses to questions posed by expert teachers, teachers may gain insight into students' assumptions and reasoning. Well-presented examples of student work can provide insight into the types of difficulties students are likely to have with complex subject matter and the materials and teaching strategies that are likely to be effective. In particular, examples of student work may help teachers develop skills in diagnosing student problems and designing lessons at an appropriate level of difficulty. Finally, by discussing examples of students' work, teachers may develop shared interpretations of the kinds of problems that are easy and difficult and the standards of performance against which students should be held.

To determine the extent to which opportunities to review student work are provided as part of Eisenhower-assisted activities, we asked each teacher in our national sample whether the teacher reviewed student work or scored assessments as part of the activity; we asked whether work completed by students in the teacher's classroom were reviewed by other activity participants or the activity leader; and we asked whether student outcomes were examined as part of an evaluation of the activity.

The results, shown in Exhibit 3.8, indicate that opportunities to review student work are relatively rare, although they are somewhat more common in SAHE grantee than district activities. For example, 19 percent of teachers in district Eisenhower activities reported that the activities provided an opportunity to review student work, as did 26 percent of teachers in SAHE-grantee activities; and nine percent of teachers in district activities scored assessments, as did 13 percent of teachers in IHE/NPO activities.

Presenting, Leading, and Writing

Apart from opportunities to observe teaching, plan classroom implementation, and review student work, professional development activities may also offer teachers the opportunity to give presentations, lead discussions, and produce written work. Active participation of this kind may improve outcomes by permitting teachers to delve more deeply into the substantive issues introduced.

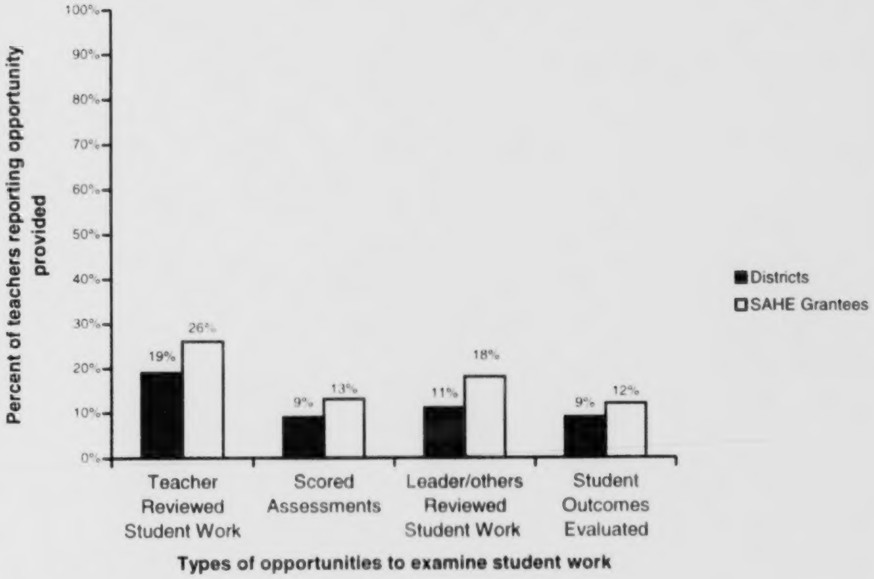
To examine the degree to which these forms of active participation are provided as part of Eisenhower-assisted activities, we asked each teacher in our national sample whether, as part of the activity, the teacher gave a lecture or presentation; conducted a demonstration of a lesson, unit, or skill; led a whole-group discussion; led a small group discussion; or wrote a paper, report, or plan.

The results, shown in Exhibit 3.9, indicate that three of these forms of active learning—giving a lecture or presentation, conducting a demonstration, and writing a report—are relatively common, at least among SAHE-grantee activities. Overall, 42 percent of teachers in SAHE-grantee activities report giving a lecture or presentation as part of the activity in which they participated, 43 percent conducted a demonstration, and 44 percent wrote a paper or report. Fewer teachers who participated in district activities report these kinds of opportunities: 18 percent of teachers in district Eisenhower-assisted activities report giving a lecture or presentation, 24 report conducting a demonstration, and 15 percent report writing a paper.

Relatively few teachers in either district or SAHE-grantee activities led whole-group or small-group discussions, although discussion is often emphasized as a strategy to be encouraged in the teaching of mathematics and science.

EXHIBIT 3.8

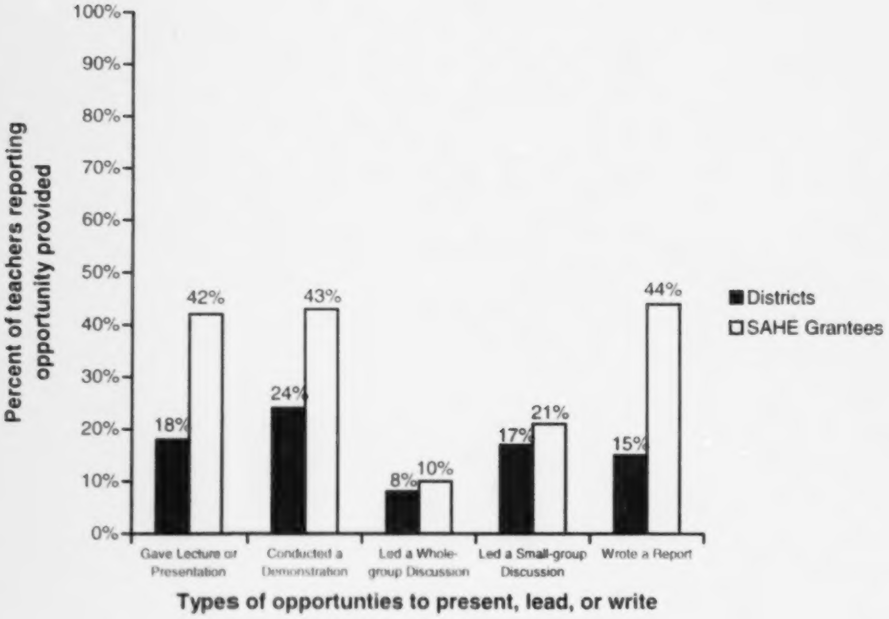
Percent of Teachers Reporting Opportunities to Examine Student Work in Eisenhower-assisted Professional Development Activities
(District n=783, SAHE Grantee n=244)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first bar shows that 19 percent of the teachers who participated in district activities report that they had an opportunity to review student work. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

EXHIBIT 3.9

Percent of Teachers Reporting Opportunities to Present, Lead, and Write in Eisenhower-assisted Professional Development Activities (District n=783, SAHE Grantee n=244)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first bar shows that 18 percent of the teachers who participated in district activities report that they had an opportunity to give a lecture or presentation. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

Overall Index of Active Learning

In the previous sections, we have focused on the extent to which Eisenhower-assisted activities provide specific types of opportunities—for example, the opportunity to be observed teaching by the activity leader, score student assessments, develop a lesson plan, or write a report. The description we have provided of the frequency with which each of these types of opportunities is offered provides one way of assessing the degree to which Eisenhower-assisted activities support active learning.

A complementary approach to examining active learning is to ask how many different types of active learning opportunities Eisenhower-assisted activities generally provide. While it is not clear that a particular number or combination of active learning strategies is necessarily more effective, activities that support multiple forms of active learning may be able to integrate these opportunities to provide strong supports for teacher change.

An Eisenhower-assisted activity provided by a SAHE-sponsored IHE in Texas, one of our in-depth case states, illustrates the ways a varied set of approaches for active learning can build upon one another to facilitate teacher development. Nineteen teachers participated in the 6th-Grade Physical Science Enhancement and Math Integration program offered by the IHE. The program was designed to create a support system to help teachers implement teaching practices consistent with the national standards in mathematics and science and the Texas Essential Knowledge and Skills. During a six-week summer institute, teachers kept journals, model classrooms were used to help teachers learn new strategies, and instructors videotaped teachers in the classroom and provided feedback. In addition, the project encouraged participants to form a network to provide support during the school year. Finally, the activity leaders spent about 200 hours in the teachers' classrooms during the following school year, observing and providing follow-up and guidance.

To examine the number of types of active learning opportunities of this kind provided in the activities in which our national sample of teachers participated, we created a composite index, summing all of the types shown in Exhibits 3.6, 3.7, 3.8, and 3.9. Because our survey included four items to measure opportunities for observation, five for planning, four for reviewing student work, and five for presenting/writing, simply summing the 18 types of opportunities included would give more weight to planning and presenting/writing than to observing and reviewing student work. Thus, in computing the index, we weighted each of the four items pertaining to observation and the four items pertaining to student work by 1.25. This produces an index that runs from zero (no opportunities were provided for active learning) to 20 (all types of active learning were provided).

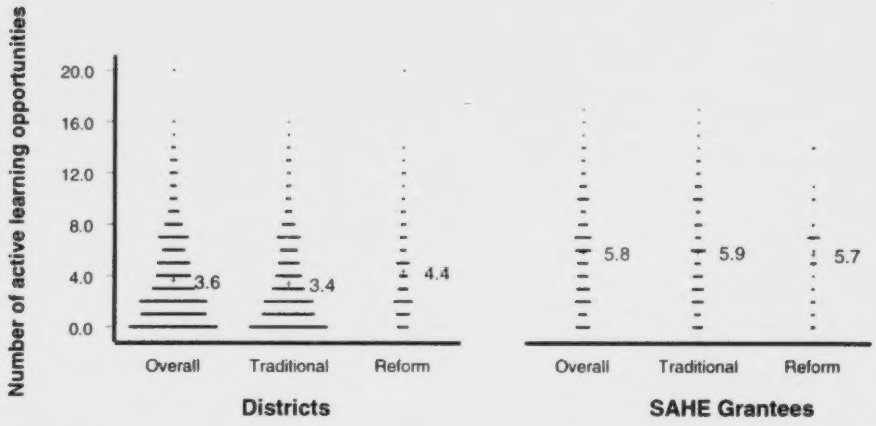
The results, shown in Exhibit 3.10, indicate that activities vary widely in the number of opportunities they provide for active learning, but, overall, SAHE-grantee activities provide more opportunities for active learning than district activities. On the average, teachers report that district activities provide 3.6 types of active learning (of the maximum of 20 possible on the scale), but the range is enormous. About 21 percent of teachers are in district activities that provide no opportunities for active learning, while some are in activities providing more than eight types. On the average, teachers in SAHE-grantee activities report 5.8 types of active learning, although, as for districts, there is a wide range. About nine percent of teachers in SAHE-grantee activities report no opportunities for active learning.

As anticipated, reform activities tend to offer more opportunities for active learning than traditional activities, for activities supported through the district component of the program. On average, teachers participating in district reform activities report 4.4 types of active learning, compared with 3.4 types for traditional activities. There is little difference in opportunities for active learning between traditional and reform activities supported through the SAHE component of the program.

Our data on active learning opportunities suggest that some Eisenhower-assisted activities—particularly those supported in the SAHE component of the program—provide a diverse set of active learning activities. But many Eisenhower-assisted activities—especially traditional activities supported under the district component of the program—do not yet incorporate the kinds of active learning opportunities the literature suggests are required to support ongoing improvement in teacher knowledge, skills, and teaching practice. Thus, this is an area in which further program improvement efforts might focus.

EXHIBIT 3.10

Number of Opportunities for Active Learning in Eisenhower-assisted Professional Development Activities, as Reported by Teachers (District n=767, SAHE Grantee n=244)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first distribution shows that on average, those teachers who participated in district activities reported that they were given 3.6 opportunities for active learning, where 0 indicates no opportunity and 20 indicates full opportunities on all 18 different active learning items. Traditional vs. reform types of activities differed significantly in the opportunities for active learning for the district component activities, but not for the SAHE-grantee component activities. Each dot represents one teacher. As the number of teachers at one data value increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of teachers for that particular category. The number to the right of the distribution is the mean.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

Nurturing Coherence

The third core feature of professional development concerns the extent to which professional development activities are perceived by teachers to be a part of a coherent program of teacher learning. Up until this point, in examining the quality of professional development activities supported by the Eisenhower program, we have focused on experiences that occur as part of the activity itself—the content covered and the opportunities for active learning provided. To some extent, however, the quality of a professional development experience is also a function of the relationship of the experience itself to other aspects of a teacher's work (Darling-Hammond & McLaughlin, 1996). Developing coherent knowledge-based visions are important conditions for learning (McCarthey & Peterson, 1993). Professional development for teachers is frequently criticized on the ground that the activities are disconnected from one-another—in other words, individual activities do not form part of a coherent program of teacher learning and development. A professional development activity is more likely to be effective in improving teachers' knowledge and skills if it forms a coherent part of a wider set of opportunities for teacher learning and development.

The coherence of a teacher's professional development experience can be assessed in at least three ways. First, coherence can be judged in terms of the degree to which an individual professional development activity builds on what teachers have already learned and is followed up with other, more advanced work. The coherence of an activity can also be judged in terms of the extent to which the activity emphasizes content and pedagogy aligned with national, state, and local standards, frameworks, and assessments. Finally, the coherence of an activity can be judged on the basis of the extent to which the activity supports teachers in developing sustained, ongoing professional communication with other teachers who are trying to change their teaching in similar ways.

In the following sections, we consider each of these aspects of coherence in turn.

Connections with Goals and Other Activities

One way to assess whether a professional development activity is part of a coherent program of teacher learning is to ask whether the activity builds on earlier activities and is followed up with later, more advanced work. Are the individual professional development opportunities provided for teachers linked so they build upon one another? Do professional development activities make it possible for teachers to advance from more basic to more advanced topics and skills, covered in greater depth? Or, do professional development opportunities tend to repeat content from earlier activities, at the same depth?[23]

Furthermore, are the opportunities provided linked to teachers' goals for development? Do teachers perceive that the available activities are central to the issues of teaching and learning that they believe need more attention?

To address these issues, we asked each teacher in our national sample to report the extent to which the activity the teacher attended was consistent with the teacher's goals for professional development; based explicitly on what the teacher had learned in earlier professional development experiences; and followed up with activities that built upon what was learned in this professional development activity. Teachers responded on a scale from one to five, where one=not at all and five=to a great extent.

The results, shown in Exhibit 3.11, indicate that almost all teachers believe the Eisenhower-assisted activities in which they have participated are consistent with their goals: 79 percent of teachers in district activities report that the activities in which they participated were quite consistent with their goals (that is, they reported a value of four or five on the five-point response scale); and 88 percent of teachers in SAHE-grantee activities reported that the activities were consistent with their goals.

Many fewer teachers report that the Eisenhower-assisted activities build upon earlier activities: 35 percent of teachers in district activities and 39 percent of teachers in SAHE-grantee activities report that the activity built on earlier activities.

Somewhat more teachers report that the Eisenhower-assisted activities in which they participated were *followed up* with additional activities than reported that Eisenhower-assisted activities *built upon* earlier work. About 53 percent of teachers in district activities report that they were followed up with more advance work, as did 70 percent of teachers in SAHE-grantee activities.

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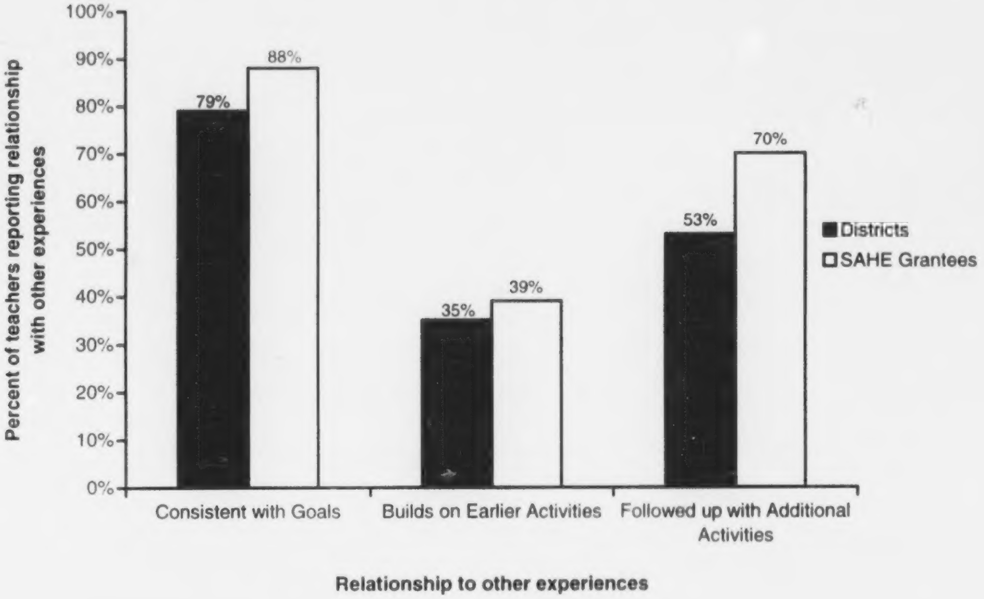
[23] To some extent, the issues here are parallel to those posed in assessing the learning opportunities provided for students.

EXHIBIT 3.11

Percent of Teachers Reporting That Eisenhower-assisted Professional Development Activities are Related to Their Other Professional Development Experiences (District n=748 to 760, SAHE Grantee n=238 to 239)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first bar shows that 79 percent of the teachers who participated in district activities report that the activity was consistent with their own goals. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program. Due to missing data, the district n ranges from 748 to 760 and the SAHE Grantee n ranges from 238 to 239.

Alignment with State and District Standards and Assessments

A second aspect of coherence concerns the alignment of the content and pedagogy emphasized in the activities with national, state, and local frameworks, standards, and assessments. Teachers receive guidance about what to teach and how to teach it from multiple sources, including the material covered in formal professional development, as well as in their pre-service education, textbooks, national standards, state and local policies and assessments, and the professional literature (Cohen & Spillane, 1992). To the extent that these sources provide a coherent set of goals for teaching and learning, they may facilitate teachers' efforts to improve their teaching practices. To the extent that they conflict, however, the sources of guidance may create tensions that impede teachers' efforts to develop their teaching in a consistent direction (Grant, Peterson, & Shojgreen-Downer, 1996).

Efforts to align professional development with state and district frameworks, standards, and assessments offer one approach to increasing the coherence of the instructional guidance teachers receive. The process of aligning professional development with state and district standards and other policies can take a number of forms. For example, professional development activities can be chosen to reflect the topics emphasized in state and district standards. Or, professional development activities can focus on the goals for student learning emphasized in state assessments or the pedagogical methods emphasized in state curriculum frameworks (Webb, 1998).

A professional development activity in Riverside, Washington, one of our case-study districts, illustrates the use of Eisenhower funds to encourage professional development that is aligned with standards. The Riverside Elementary Science Kit project is an ongoing process that started in 1990, when teachers began attending a series of extended workshops on science concepts. After several years of related workshops, building from simple to more advanced topics, between 30 and 50 teachers were prepared and ready to begin creating kits They began creating three to four kits in each grade level: one concept kit, and two or three content kits per grade.

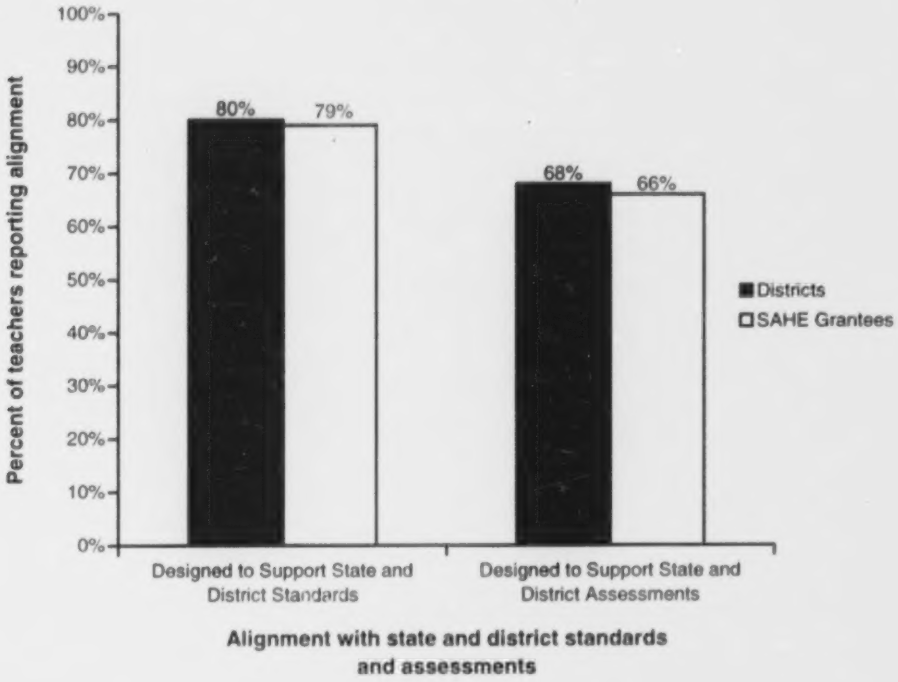
Thirty-one kits have now been completed, focusing on earth, life, and physical science. Currently, Eisenhower-assisted workshops are being used to develop standards for the scoring of the student work included in the kits. These workshops are designed to help match state and national learning standards to the scoring methods used for the kits. After completing the workshops, the teachers are expected to know which state and national standards the science kits satisfy, and they should be able to understand the goals for student learning embodied in each kit.

To obtain a measure of the alignment of Eisenhower-supported professional development with state and district standards, we asked each teacher in our national sample to indicate the extent to which the activity in which the teacher participated was aligned with state or district standards and curriculum frameworks, and with state and district assessments. Teachers were asked to respond using a five-point scale, from 1=not aligned at all to 5=aligned to a great extent.

The results, displayed in Exhibit 3.12, show that most teachers report that the activities they participated in were aligned with state and district standards, frameworks, and assessments, although teachers report somewhat more alignment between professional development with standards and frameworks than assessments. Overall, 80 percent of teachers participating in Eisenhower-assisted activities report that the activities were well aligned with state and district standards (reporting a four or five on the five-point scale), while 68 percent report that the activities were well aligned with state and district assessments. The results for SAHE-grantee activities are nearly identical. Although our data do not permit us to judge the depth of the alignment reported in our surveys, our results do indicate that teachers perceive that the activities in which they participate are quite consistent with state and district standards and frameworks, and moderately consistent with state and district assessments.

EXHIBIT 3.12

Percent of Teachers Reporting That Their Eisenhower-assisted Activities are Aligned with State and District Standards, Frameworks, and Assessments (District n=748 to 753, SAHE Grantee n=238)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first bar shows that 80 percent of the teachers who participated in district activities report that the activity was designed to support state or district standards. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program. Due to missing data, the district n ranges from 748 to 753; the SAHE Grantee n is 238.

Communication with Others

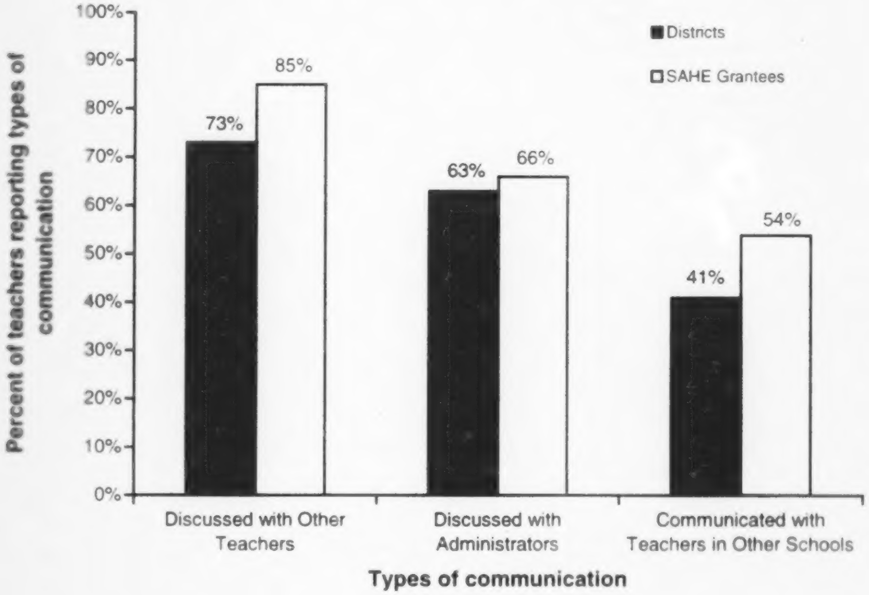
The third dimension of coherence concerns the ways in which professional development activities encourage professional communication among teachers who are engaged in efforts to reform their teaching in similar ways. Efforts to change teaching practices generally engender problems, challenges, and dilemmas as teachers attempt to carry out in the classroom ideas that were introduced in professional development activities. An ongoing discussion among teachers who confront similar issues can facilitate change by encouraging the sharing of solutions to problems, as well as by reinforcing the sense that, with time, improvement is possible. There is some evidence, for example, that networks of teachers involved in change can help sustain motivation (Lieberman & McLaughlin, 1992). In addition, by sharing methods, discussing written work, and reflecting on problems and solutions, teachers may foster a better understanding of the goals for student learning that proposed changes in teaching imply. Communication with other teachers is another dimension of coherence.

To measure the extent to which teachers in our national sample were encouraged to establish professional communication as part of the Eisenhower-assisted activities in which they participated, we asked the teachers whether they had discussed what they learned with other teachers in their school or department *who did not attend* the activity; whether they had discussed or shared what they learned with *administrators* (e.g., principal or department chair); and whether they had communicated, outside of formal meetings held as part of the activity, with participants in the activity who teach in other schools.

The results are shown in Exhibit 3.13. The data indicate that most teachers report discussing what they learned with other teachers in their school who did not attend the professional development activity, and most also discuss what they learned with school administrators. Somewhat fewer teachers, however, report communicating with teachers in other schools.

EXHIBIT 3.13

Percent of Teachers Reporting That They Communicate with Other Teachers About Their Experiences in Eisenhower-assisted Professional Development Activities (District n=783, SAHE Grantee n=244)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first bar shows that 73 percent of the teachers who participated in district activities report that they discussed what they learned with other teachers in their school who did not attend the activity. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

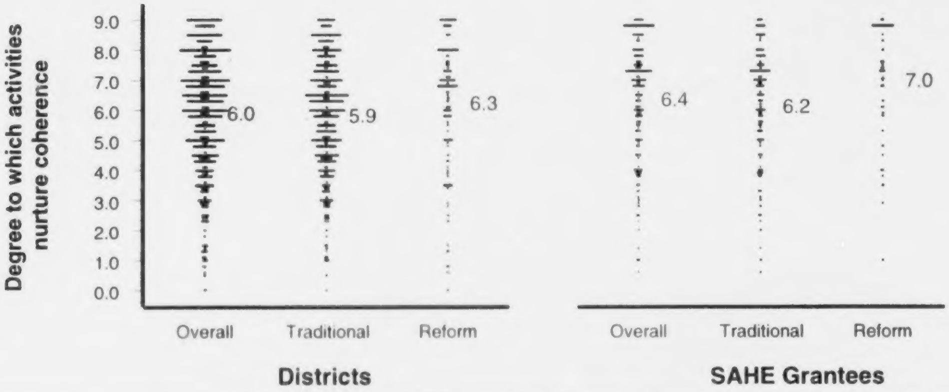
Overall Index of Coherence

To provide a composite measure of the overall extent to which Eisenhower-assisted activities are a part of a coherent program of professional development, we combined the items that comprise our three specific dimensions of coherence. The composite sums the items shown in Exhibits 3.11, concerning connections to teachers' goals and other professional development experiences; Exhibit 3.12, concerning alignment; and Exhibit 3.13, concerning professional communication. Because three items are available for the first and third of these dimensions, while only two items are available for the second, we weighted the items for the second dimension by 1.5. This produces a scale that runs from zero (the activity did not include any of the types of coherence we measured) to nine (the activity provided all of the forms we measured).

The results, displayed in Exhibit 3.14, indicate that both district and SAHE-grantee activities incorporate many of the features of coherence we measured, although the variation across activities is substantial. The average number of types of coherence reported for district activities is 6.0 (on our 0-9 scale), and the average for SAHE-grantee activities is 6.4. Reform activities incorporate somewhat more forms of coherence than traditional activities (6.3 versus 5.9 for districts, and 7.0 versus 6.2 for SAHE grantees).

EXHIBIT 3.14

Degree to Which Eisenhower-assisted Professional Development Activities Foster Coherence, as Reported by Teachers (District n=747, SAHE Grantee n=235)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first distribution shows that on average, those teachers who participated in district activities reported that the activity provides a 6.0 coherence scale score, where zero indicates no coherence and 9.0 indicates full coherence on all eight different coherence items. Compared to the traditional types of activities, reform types were significantly higher in terms of coherence. Each dot represents one teacher. As the number of teachers at one data value increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of teachers for that particular category. The number to the right of the distribution is the mean.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

These results indicate that most teachers perceive Eisenhower-assisted activities to be integrated in a variety of ways into their professional lives. This clearly suggests that progress has been made since the previous Eisenhower evaluation, when Eisenhower-assisted activities were

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described as "one-shot" (Knapp et al., 1991). Given the survey data we have available, we cannot be sure how deeply integrated Eisenhower-assisted activities are into the fabric of teachers' professional work, but we can conclude that many activities are fostering important linkages with teachers' other professional development, state and district standards, and other teachers.

In addition, as we had anticipated, reform activities are more likely to foster coherence than traditional activities, such as workshops and institutes. Because reform types of activities, such as mentoring, coaching, and study groups, frequently take place during the regular school day, it is undoubtedly easier for such activities to foster communication among teachers. The fact that reform activities are tied to the daily life of the school may also help such activities foster other aspects of coherence—particularly alignment with standards.

Summary: Core Features

Our results on the core features of Eisenhower-assisted professional development activities provide a mixed picture. We examined three core dimensions of the professional development activity: content focus, active learning, and coherence. With respect to the first, most teachers participating in Eisenhower-assisted activities report that the activities in which they participated placed a major emphasis on deepening their content knowledge in mathematics and science. This is quite encouraging, given the conclusions in recent literature on the potential benefits of professional development focused on specific subject-matter content (Kennedy, 1998; Cohen & Hill, 1998).

With respect to opportunities for active learning, the results appear less positive. While most teachers report that the Eisenhower-assisted activities in which they participated provide an opportunity to plan classroom implementation and to give presentations or demonstrations, relatively few provide an opportunity for teachers to observe or be observed or to examine student work. There is a growing body of research to suggest that these forms of active learning are critical components of effective professional development (Schifter, 1996; Carpenter et al., 1989). If so, Eisenhower-assisted activities do not completely meet standards of high quality in this respect.

Finally, with respect to coherence, our results are reasonably positive. Most teachers report that the activities in which they participated were connected to their goals for professional development and other professional learning opportunities, aligned with state and district standards and assessments, and led to professional communication with other teachers.

Our results also support two other conclusions. First, teachers participating in activities supported through the SAHE component of the program are more likely to report that the activities emphasized mathematics and science content, have opportunities for active learning, and more aspects of coherence than teachers participating in district activities. As we will discuss later in this chapter, these differences can be explained in part by the longer duration of SAHE-grantee activities.

In addition, our results indicate that reform activities are more likely than traditional activities to provide active learning opportunities and more likely to encourage coherence. The differences between reform and traditional types of professional activities in opportunities for active learning are not as large as the differences between SAHE-grantee and district activities, however, and, in relation to the overall variation among activities, are only moderate in size. The reform-traditional differences in coherence are larger, however, suggesting that reform activities are especially valuable in encouraging integration of professional development with other aspects of teachers' work.

Our results provide evidence that can be used to assess the Eisenhower program with respect to two of the Department of Education's Performance Indicators for the program (see box). The first indicator, pertaining to alignment, sets as a standard that over 50 percent of teachers participating in Eisenhower-assisted activities will participate in activities that are aligned with high standards. As shown in Exhibit 3.12, 80 percent of teachers participating in Eisenhower-assisted activities report that the activities were designed to support state and district standards—far more than the standard of 50 percent. We do not know the depth of alignment this represents, nor whether the state and district standards with which Eisenhower activities are aligned are truly "high." But these results are encouraging.

***Indicator 2.1* District-level Professional Development**. By 1998, over 50 percent of teachers participating in district-level or higher education Eisenhower-assisted professional development will participate in activities that are aligned with high standards. By 2000, over 75 percent will.

***Indicator 3.1* High Quality.** By 1998, over 50 percent of teachers participating in district-level, Eisenhower-assisted professional development activities will participate in activities reflecting best practices, including a focus on continuous improvement. By 2000, over 75 percent will.

The second indicator, pertaining to quality, sets as a standard that over 50 percent of teachers participating in Eisenhower-assisted professional development will participate in activities that are of high quality. Here, we have multiple measures that can be used. Our data on content focus, the first core feature, indicate that 51 percent of teachers participating in Eisenhower-assisted activities participate in activities that place a major emphasis on content. By this measure, Eisenhower activities meet the standard set in the indicator. Our data on the active learning, the second core feature, are more mixed; fewer than 50 percent of teachers are in activities providing some of the key dimensions of active learning, such as the opportunity to observe and be observed, or the opportunity to review student work (see Exhibits 3.7 and 3.8). While more teachers report opportunities to plan classroom implementation and to conduct presentations and demonstrations, less than half of teachers in district activities report most of these experiences. Finally, our data on coherence, the third core feature, are reasonably positive. More than 50 percent of teachers participating in district activities report that the activities in which they participated are consistent with their goals were followed up with later experiences, were aligned, and nurtured professional communication.

In the next section, we turn our attention from the core features of Eisenhower-assisted activities to their reported effects on teacher knowledge, skills, and teaching practices.

TEACHER OUTCOMES

Section Findings

- *Many teachers report that participation in Eisenhower-assisted activities enhanced their knowledge and skills. For example, almost half of the teachers participating in district Eisenhower activities report that participation enhanced their knowledge of mathematics and science; nearly 70 percent of teachers participating in IHE/NPO activities report enhanced knowledge of mathematics and science.*

- *Many teachers also report improvements in their classroom instruction as a consequence of participation in Eisenhower-assisted activities. For example, 55 percent of the teachers participating in district Eisenhower activities and 66 percent of teachers participating in IHE/NPO activities report increasing the cognitive challenge of classroom instruction.*

The main goal of the Eisenhower Professional Development Program is to increase teachers' knowledge and skills in order to improve their teaching practice, which in turn will increase student learning and achievement. The law requires that states develop professional development plans designed to give teachers "the knowledge and skills necessary to provide all students the opportunity to meet challenging State content standards and challenging State student performance standards" (Section 2205(B)(2)(b)). Also it requires that LEAs use Eisenhower funds to "give teachers and administrators the knowledge and skills to provide students with the opportunity to meet challenging State or local content standards and student performance standards" (Section 2210(b)(1)).

In the following paragraphs, we examine the extent to which teachers participating in Eisenhower-assisted activities report outcomes consistent with these legislative purposes, focusing first on the extent to which teachers' knowledge and skills are enhanced as a results of participation, and then on improvements in teaching practice.

Teacher Knowledge and Skills

To assess the effects of participation on teachers' knowledge and skills, we asked each teacher in our national sample to indicate the degree to which his or her knowledge and skills were enhanced as a result of participation in the specific Eisenhower-assisted activity that drew the teacher into the sample. We asked each teacher to indicate the extent to which knowledge and skills had been enhanced in each of the following areas:

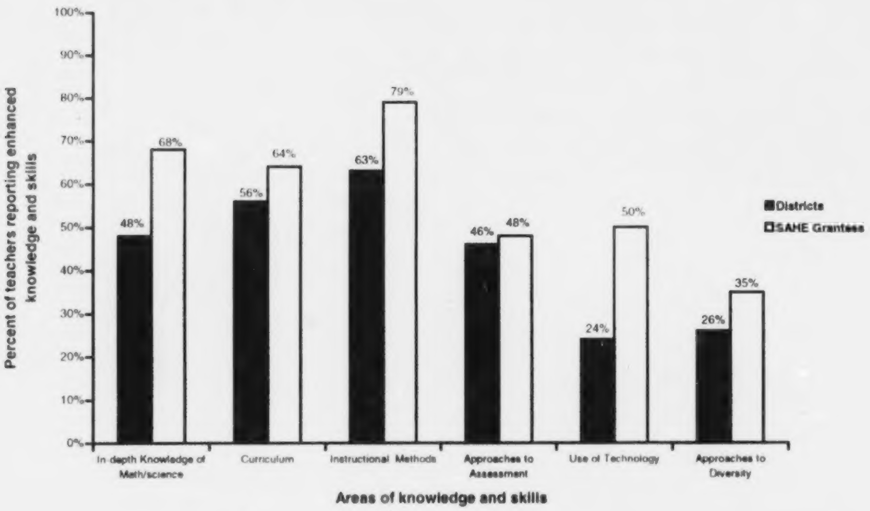
- Curriculum (e.g., units, texts, standards)
- Instructional methods
- Approaches to assessment
- Use of technology in instruction (e.g., computers, graphing calculators)
- Strategies for teaching diverse student populations (e.g., students with disabilities, from underrepresented populations, economically disadvantaged, limited English proficient, range of abilities)
- Deepening knowledge of mathematics

Teachers reported their responses using a five-point scale, where 1=not at all and 5=to a great extent. Our data, shown in Exhibit 3.15, indicate that teachers who participated in SAHE-grantee activities tended to report more change in their knowledge and skill than teachers who participated in district activities.[24] For example, 68 percent of teachers participating in SAHE-grantee activities reported that their participation led to improvements in their content knowledge in mathematics and science (responding with a four or five on the five-point scale) compared to 48 percent of teachers in district activities. Similarly, 64 percent of teachers in SAHE-grantee activities reported enhanced knowledge and skills in curriculum, and 79 percent in instructional methods, compared with 56 and 63 percent, respectively, for district activities. In addition, teachers in SAHE-grantee activities are substantially more likely to report enhanced knowledge in technology than teachers in district activities (50 percent versus 24 percent), and somewhat more likely to report enhanced knowledge in approaches to diversity (35 percent versus 26 percent).

This pattern differs somewhat for approaches to assessment: 48 percent of teachers in SAHE-grantee activities report enhanced knowledge and skills, as do 46 percent for teachers in district activities, a negligible difference. We are not sure how to explain the lack of difference between districts and SAHE grantees in this domain.

EXHIBIT 3.15

Percent of Teachers Reporting Enhanced Knowledge and Skills Due to Participation in Eisenhower-assisted Professional Development Activities (District n=731 to 750, SAHE Grantee n=233 to 240)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first bar shows that 48 percent of the teachers who participated in district activities report their in-depth content knowledge and skills have been enhanced substantially as a result of professional development. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program. Due to missing data, the district n ranges from 731 to 750; the SAHE Grantee n ranges from 233 to 240.

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[24] Analyses, presented in detail later in the chapter, show that the difference in reported outcomes between districts and SAHE grantees can be explained almost entirely by the fact that SAHE-grantee activities are longer and give more emphasis to content, active learning, and coherence.

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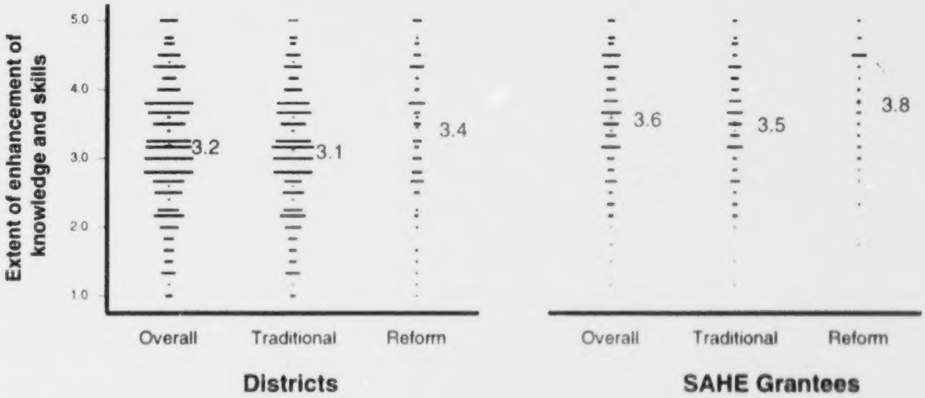
We averaged each teacher's responses on these six items to create a composite scale measuring enhanced knowledge and skills. The results are displayed in Exhibit 3.16. One fact immediately visible in the exhibit is the substantial variation among teachers in reported enhancement in knowledge and skills. A few teachers have composite scores of one, meaning no change in knowledge and skills, while a few have composite scores of five, indicating knowledge and skills were enhanced to a great extent in all six domains measured. The average composite score for teachers participating in district activities is 3.2, while the average for teachers in SAHE-grantee activities is 3.6. Our results also indicate that the average enhancement of knowledge and skills is somewhat higher for teachers participating in reform activities than for teachers in traditional activities.

EXHIBIT 3.16

Extent to Which Participation in Eisenhower-assisted Professional Development Activities Enhanced Knowledge and Skills, as Reported by Teachers (District n=750, SAHE Grantee n=240)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998
How to read this exhibit: The first distribution shows that, on average, those teachers who participated in district activities reported that the extent to which their knowledge and skills have been enhanced in six different areas was 3.2, where zero indicates no enhancement and five indicates great enhancement. Compared to traditional types of activities, reform types were significantly higher in terms of enhancement of knowledge and skills. Each dot represents one teacher. As the number of teachers at one data value increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of teachers for that particular category. The number to the right of the distribution is the mean.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

Change in Classroom Teaching Practice

We conducted a similar analysis of changes in teaching practice. We asked the teachers in our national sample to what extent they made changes in their teaching practices in each of the following domains, as a result of the professional development activity:[25]

- The mathematics curriculum content
- The cognitive challenge of math classroom activities
- The instructional methods employed
- The types or mix of assessments used to evaluate students
- The ways technology (calculator or computer) is used in instruction
- The approaches taken to student diversity.

Teachers were asked to report responses on a scale from 0 to 3, where 0=no change, 1=minor change, 2=moderate change, and 3=significant change.

Exhibit 3.17 shows that the results are generally parallel to those for knowledge and skills. The exhibit displays the percent of teachers responding that they made moderate or significant changes in their teaching. In particular, in most domains, teachers in SAHE-grantee activities are more likely to report change in teaching practice than teachers in district activities. However, in one domain—approaches to assessment—teachers in district activities are more likely to report change in practice than teachers in SAHE-grantee activities.

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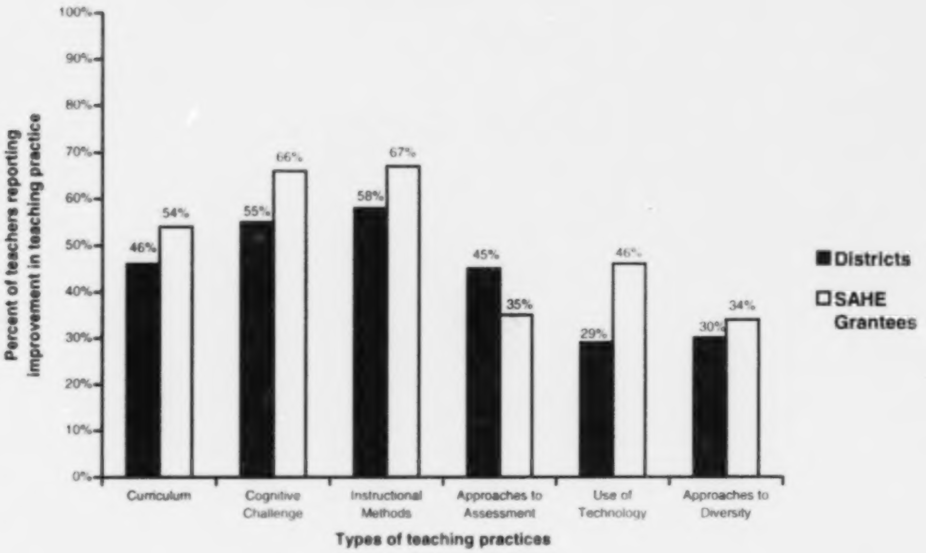
[25] The results we report here are based on self-report data. In our third report, we will report parallel analyses based on the longitudinal study of teacher change, which includes data on teaching practice in the 1996-97, 97-98, and 98-99 school years.

EXHIBIT 3.17

Percent of Teachers Reporting Improvement in Classroom Teaching Practice Due to Participation in Eisenhower-assisted Professional Development Activities (District n=731 to 750, SAHE Grantee n=233 to 244)

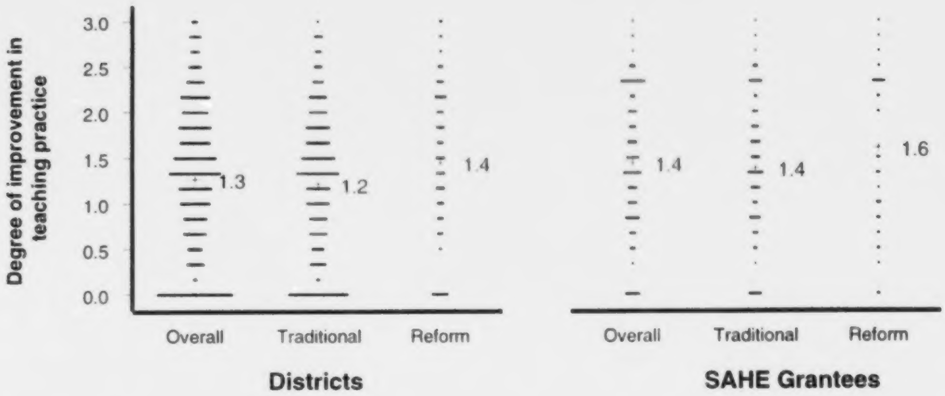


Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first bar shows that 46 percent of the teachers who participated in district activities report that their teaching practices in the curriculum content area have improved substantially as a result of participation in an Eisenhower-assisted professional development activity. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program. Due to missing data, the district n ranges from 731 to 750; the SAHE Grantee n ranges from 233 to 240.

We averaged each teacher's responses to these six items to create a composite scale measuring change in teaching practice. The results appear in Exhibit 3.18. One notable pattern is that some teachers (about 17 percent in district activities and 10 percent in SAHE-grantee activities) report no change in teaching practice in any of the domains we measured. At the same time, some teachers report very high levels of change, with composite scores of 3 (the maximum value) on our scale.

EXHIBIT 3.18

Degree of Improvement in Classroom Teaching Practice Due to Participation in Eisenhower-assisted Professional Development Activities, as Reported by Teachers (District n=767, SAHE Grantee n=244)



Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
How to read this exhibit: The first distribution shows that, on average, those teachers who participated in district activities reported that the extent of their improvement in classroom teaching practice was 1.3, where zero indicates no change and three indicates the highest degree of change. Each dot represents one teacher. As the number of teachers at one data value increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of teachers for that particular category. The number to the right of the distribution is the mean.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

The average composite value for teachers in district activities is 1.3, indicating some change in teaching practice, while the average value for teachers in SAHE-grantee activities is 1.4. Although this difference of about 0.1 point on the composite scale appears small in numeric terms, it is statistically significant. (The standard deviation among district teachers for our change in teaching composite is about .8. This means that the difference between teachers in SAHE-grantee activities and teachers in district activities is about .125 standard deviations.) The difference between traditional and reform activities is somewhat greater. The average composite score is 1.4 for teachers in district reform activities and 1.2 for district traditional activities, a difference of 0.2 point. The parallel results for teachers in SAHE-grantee activities are 1.6 and 1.4, also a difference of 0.2 point.

Summary: Teacher Outcomes

Overall, our results indicate that a substantial portion of teachers in SAHE-grantee activities, and a smaller but still notable proportion of teachers in district activities, report that participation enhanced their knowledge and skills. For example, 68 percent of teachers participating in SAHE-grantee activities reported enhanced knowledge in mathematics and science, compared with 48 percent of teachers in district activities.

A large proportion of teachers in SAHE-grantee activities and a somewhat smaller proportion in district activities also report changes in teaching practice, as a result of participation. For example, 66 percent of teachers in SAHE-grantee activities and 55 percent of teachers in district activities report making changes in the cognitive challenge of classroom activities as a result of participation.

Our data indicate that teachers participating in reform types of activities, such as mentoring, coaching, and study groups, are somewhat more likely than teachers in traditional forms of professional development, such as workshops, to report enhanced knowledge and skills. They are also more likely to report change in teaching practice.

With respect to knowledge and skills, the effect of program component (SAHE grantee versus district) is larger than the effects of activity type (reform versus traditional). But, with respect to change in teaching practice, the effect of program component (SAHE grantee versus district) is smaller than the effect of activity type (reform versus traditional). This may be a consequence of the fact that SAHE-grantee activities are especially likely to focus on subject matter content, and thus they have a strong effect on teachers' reported change in knowledge and skills. Reform activities are especially likely to encourage coherent professional development, including alignment and professional communication among teachers, and these elements may be important supports for change. (This issue is discussed further in the following section.)

Indicator 1.1 **Teachers' Skills and Classroom Instruction**. By 1998, over 50 percent of a sample of teachers will show evidence that participation in Eisenhower assisted professional development has resulted in an improvement in their knowledge and skills, and by 2000, over 60 percent will show such evidence. By 1999, over 50 percent of a sample of teachers in selected sites will show evidence that participation in Eisenhower-assisted professional development has resulted in improved classroom instruction.

Our data can be used to assess Eisenhower professional development with respect to the Department of Education's performance indicator 1.1 (see box), pertaining to change in teacher knowledge and skills. The indicator sets a standard of 50 percent of teachers reporting enhanced knowledge and skills as a result of participation. Our results indicate that district activities meet this standard for two domains of knowledge and skills (curriculum and instruction), but not the other four (in-depth knowledge in mathematics and science, approaches to assessment, uses of technology, and approaches to student diversity). SAHE-grantee activities meet the standard in four of the six domains (in-depth knowledge, curriculum, instruction, and uses of technology).

One way to assess the magnitude of the reported enhancement of knowledge and skills is to compare the results we obtained with the results for professional development activities that have been identified as exemplary. Data on enhancement of knowledge and skills somewhat parallel to ours are available for teachers participating in 34 exemplary summer institutes in mathematics and science, supported by the National Science Foundation, the Department of Education, and other agencies (Carey & Frechtling, 1997). A comparison of our data for SAHE-grantee activities with the results obtained for the 34 exemplary activities indicates that teachers participating in SAHE-grantee activities report enhancement of knowledge and skills in mathematics and science content roughly comparable to the results for the 34 exemplary activities.[26] Teachers participating in district Eisenhower activities show somewhat weaker results than do teachers in the 34 exemplary activities.

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[26] Carey and Frechtling (1997) indicate that 44 percent of participants in outstanding teacher development programs reported that the programs enhanced their knowledge and understanding of science content to "a great extent" (value of 5 on their 5-point scale). If we isolate the percentage of participants in SAHE-grantee activities who reported that the activity enhanced their mathematics or science knowledge "to a great extent" (value of 5 on the 5-point scale), the percentage is 41 percent. The comparable percent for district activities is 24 percent.

PARTICIPATION OF TEACHERS FROM HIGH-POVERTY SCHOOLS

Section Findings

- *Teacher participants in district Eisenhower-assisted activities are only slightly more likely to be from high-poverty schools than are teachers in the national teaching force as a whole. Teacher participants in SAHE-grantee activities are less likely to be from high-poverty schools than are teachers in the national teaching force.*

The Eisenhower legislation emphasizes that programs and activities should be provided to teachers of diverse populations of students. Several provisions of the law state that funds should be used to provide professional development that benefits students from diverse backgrounds. One of the law's purposes is to incorporate

> …effective strategies, techniques, methods, and practices for meeting the educational needs of diverse student populations, including females, minorities, individuals with disabilities, limited English proficient individuals, and economically disadvantaged individuals, in order to ensure that all students have the opportunity to achieve challenging State student performance standards (Section 2002(1)(D)).

In addition, the local plan for professional development is required to describe how local professional development activities will meet the needs of teachers of diverse student populations. For example, applications from LEAs are required to include a description of how their Title II activities "will address the needs of teachers in schools receiving assistance under part A of Title I" (Section 2208(d)(1)(B)).

These provisions are indicative of the fact that teachers in high-poverty, low-achieving schools are often most in need of professional development (Darling-Hammond, 1997b). Teachers in high-poverty schools are often less experienced than teachers in other schools, they frequently have students who are more challenging to teach, and they often face larger class sizes and fewer resources than are common in low-poverty schools (Darling-Hammond, 1997b; U.S. Department of Education, 1999a). In addition, teachers in high-poverty schools often have fewer opportunities to participate in certain kinds of professional development than their counterparts at more middle-class schools (U.S. Department of Education, 1998a).

To estimate the percent of Eisenhower participants from high-poverty schools, we drew on data on the percent of students eligible for the free lunch in each of the schools in which teachers in our national sample taught at the time of the survey.[27] We classified schools as high-poverty if the percent of students eligible for free lunch were 50 percent or greater.[28] For comparison, we conducted a parallel analysis of the percent of teachers in high-poverty schools for the full national population of teachers.

The results of our analysis for participants in district Eisenhower activities are displayed in Exhibit 3.19. The initial pair of bars on the left of the exhibit indicate that, overall, 23 percent of teachers participating in district Eisenhower activities are from high-poverty schools, as compared to about 21 percent for the full national population of teachers. This difference is statistically significant, indicating that participating teachers are slightly more likely to be from high-poverty schools than are teachers in the nation as a whole ($p<.10$).

In part, this result may reflect the fact that, according to the funding formula for Title II, funds are distributed to districts based in part on the districts' Title I allocations, which are based on the number of school children in poverty. To explore the extent to which the participation of teachers from high-poverty schools is due to the funding formula, we classified the districts in our sample into three strata, by district poverty.[29]

Results on the percent of Eisenhower participants from high-poverty schools are displayed separately for the three district poverty strata in Exhibit 3.19, along with parallel data on the national percent of teachers from high-poverty schools in each of these strata. The data indicate that, in *high-poverty districts*, 45 percent of the nation's teachers as a whole are from high-poverty schools, and 51 percent of Eisenhower participants are from high-poverty schools. This difference, which is statistically significant, suggests that high-poverty districts tend to concentrate their resources on their highest poverty schools. In *medium-poverty districts*, 17 percent of Eisenhower participants are from high-poverty schools, compared with 14 percent of teachers in these districts, which suggests somewhat less targeting of resources within medium-poverty districts. In *low-poverty districts*, two percent of Eisenhower participants are from high-poverty schools, compared with four percent of teachers in these districts.

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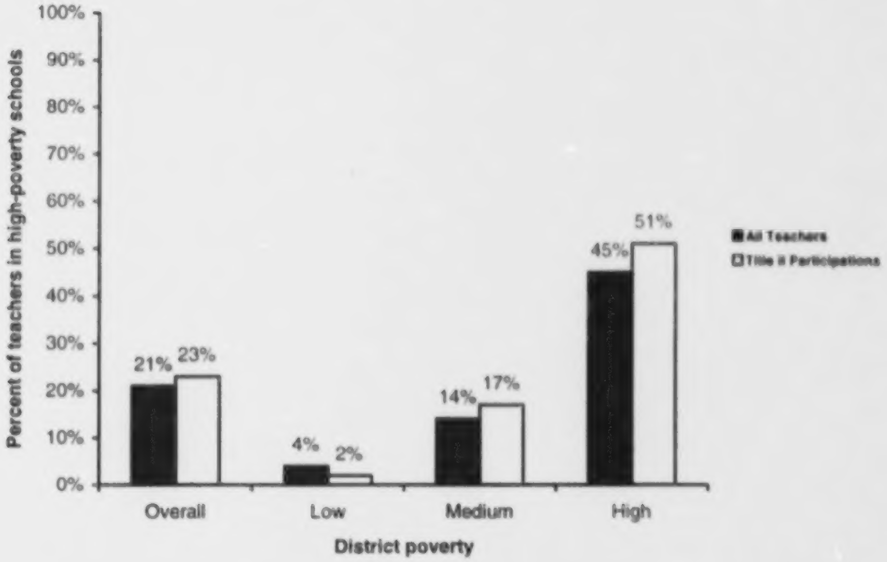
[27] We obtained these data from the Common Core of Data. The Common Core requests information on the number of students eligible for free lunch (but not reduced-price lunch) for every public school in the country. Unfortunately, data are entirely missing from some states and for some schools in other states. We used a hot-deck imputation method to impute free-lunch data for these schools, based on information on district expenditures for free lunch, as well as information on school level (elementary, middle, and high school), the number of schools in the district, and the minority composition of the school in relation to the district average. Data on free-lunch participation are not generally available for private schools, and thus we excluded the small number of participating teachers from private schools from this analysis.

[28] To eliminate the potential impact of teacher non-response on this analysis, we included all teachers in our intended sample, whether or not they responded to the survey.

[29] We classified districts into three strata according to the percent of school-age children in poverty, based on the 1990 Census. We used these strata as one part of our sampling plan for districts. See Appendix A.

EXHIBIT 3.19

Percent of Teacher Participations in District Eisenhower-assisted Activities Compared to All Teachers in the Nation, Overall and by District Poverty (n=1197)



Source: Results for all teachers are based on data on the full population of schools from the CCD. Data on Title II Participations are based on the Mail Survey of Teachers Participating in Eisenhower-assisted Telephone Activities, 1998, including both respondents and non-respondents. ***How to read this exhibit***: The first bar shows that 21 percent of teachers are in high-poverty schools. The second bar shows that 23 percent of participations in Eisenhower-assisted activities are from high-poverty schools. Each bar and the number on the top of it represent the percent of teachers for each category.

We carried out a parallel analysis of the percent of teachers from high-poverty schools, for teachers participating in SAHE-grantee activities.[30] The results, shown in Exhibit 3.20, indicate that about 13 percent of SAHE-grantee participants are from high-poverty schools, which is significantly lower than the overall percent of teachers in high-poverty schools for the nation. Thus, SAHE grantees appear less successful in targeting their activities on teachers than do districts.

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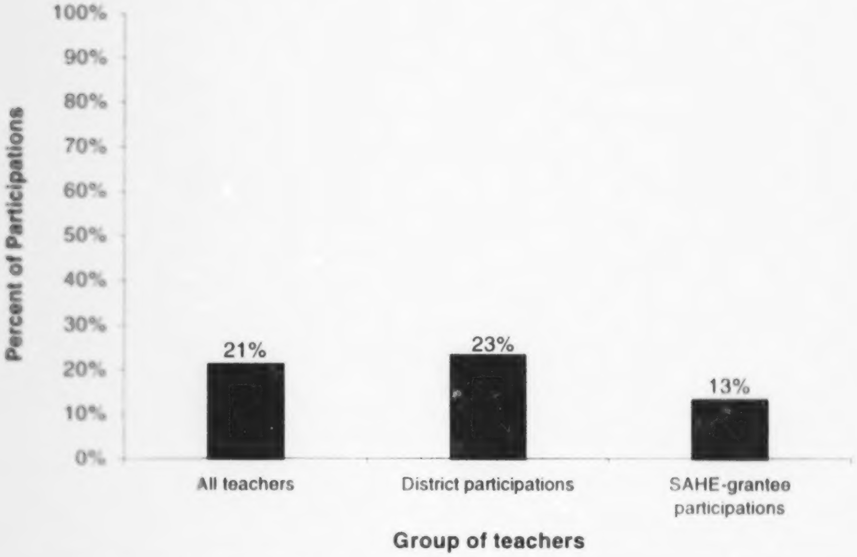
[30] Since IHE/NPO activities are not necessarily tied to particular districts, we could not examine the results by district poverty.

EXHIBIT 3.20

Percent of Teacher Participations in District and SAHE Grantee Eisenhower-assisted Activities from High-poverty Schools (District n=1197, SAHE Grantee n=254)



Source: Results for all teachers are based on data on the full population of schools from the CCD. Data on Title II Participations are based on the Mail Survey of Teachers Participating in Eisenhower-assisted Telephone Activities, 1998, including both respondents and non-respondents.
How to read this exhibit: The first bar shows that 21 percent of teachers are in high-poverty schools. The second bar shows that 23 percent of in-district Eisenhower-assisted activities are from high-poverty schools. The third bar shows that 13 percent of participations in SAHE-grantee activities are from high-poverty schools. Each bar and the number on top of it represent the percent of teachers for each category.
Note: "District participations" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE-grantee participations" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.

Summary: Participation of Teachers from High-poverty Schools

Indicator 4.1 **High-poverty Schools.** The proportion of teachers participating in Eisenhower-assisted activities who teach in high-poverty schools will exceed the proportion of the national teacher pool who teach in high-poverty schools.

Our results indicate that teachers in district Eisenhower-assisted activities are slightly more likely to be from high-poverty schools than are teachers in the nation as a whole, while teachers in SAHE-grantee activities are somewhat less likely to be from high-poverty schools. Our data for districts indicate that the standard set in the Department of Education's Performance Indicator pertaining to participation from high-poverty schools has been met for district activities. (See box.) But it has not been met for SAHE-grantee activities.

To some extent, the results for districts are encouraging: they indicate that the program has been somewhat successful at targeting resources on teachers of disadvantaged children. But the percentage of teachers from high-poverty schools served by the program is only modestly higher than the rate for the nation, indicating that the more progress might be made in this area. We give more

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attention to this issue in Chapter 4, and to targeting of participants in SAHE-grantee projects in Chapter 6.

WHAT FEATURES OF PROFESSIONAL DEVELOPMENT MAKE A DIFFERENCE FOR TEACHER OUTCOMES?

In the previous sections of the chapter, we have described the quality of Eisenhower-assisted activities—as defined by their structural and core features—and teacher outcomes for Eisenhower-assisted activities, as reported by teachers in our national sample. Now, we draw on these data to examine the relationships among these characteristics of professional development activities, in an effort to identify the characteristics of professional development activities that are related to teacher outcomes.

Throughout the chapter, we have characterized professional development activities in terms of structural and core features. We view the three structural features—activity type (reform versus traditional), duration, and collective participation—as elements that set the parameters or context in which a professional development activity takes place. And we view the three core features—content focus, active learning, and coherence—as characteristics of the professional development processes and experiences that take place during an activity. Given this framework, we expect the structural features of professional development to play an important role in determining the substance or core of the professional development experienced by teachers; and we expect the core features of the professional development experienced to contribute to teacher outcomes, including enhanced knowledge and skills and improvements in teaching practice.

To test this view of professional development, we estimated a formal causal model, using data from our national sample of teachers. The model serves two related purposes: it enables us to determine whether the relationships we have hypothesized are supported by the data we have collected, and it also permits us to develop estimates of the strength of these relationships. The model incorporates the following measures of the *structural features* of professional development: activity type (coded reform=1, traditional=0); two aspects of duration—time span (coded 1=less than one day, 6=more than one month) and number of contact hours; and collective participation (coded 0=not collective, 1=somewhat, 2=collective).[31]

The model also incorporates the following measures of the *core features* of the professional development experiences: content focus (coded 0=not at all, 1=minor emphasis, 2=major emphasis); active learning (coded as the number of types of opportunities for active learning, from 0 to 20); and coherence (coded as the number of elements of coherence, from 0 to 9).

Finally, the model includes the following *outcome* measures: enhanced knowledge and skills (coded from 1=not at all to 5=great extent); and change in teaching practice (coded from 0=no change to 3=significant change).

Since it is possible that teachers in different types of schools or teachers with different characteristics may experience different types of professional development, we have included *school*

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[31] See Appendix E for more a more detailed description of the variables.

and teacher characteristics as control variables in our model. The model includes the characteristics of the schools in which the participating teachers teach: the percent of students eligible for free lunch and the percent of minority enrollment. The model also includes five characteristics of the participating teachers: gender, subject of the teacher's professional development experience (mathematics or science); grade level (elementary, middle, or high school); whether the teacher is certified in the teacher's main teaching field; and the teacher's teaching experience, in years.[32] (See Appendix E for more information on our measures of these school and teacher characteristics.)

In addition, since we are interested in understanding the differences between activities supported through the district and SAHE component of the program, we have also included the sponsorship of the activity as a variable in the model (coded 1=SAHE grantee, 0=district).

The results are shown in Exhibit 3.21. (A more detailed presentation of the results appears in Appendix E.) The results shown are expressed as standardized path coefficients, which represent the relative influence of one variable on another. Path coefficients generally have values between –1 and +1, and coefficients with larger absolute values indicate stronger relationships. All paths shown are statistically significant.

To interpret the results, we begin by discussing the variables at the left-hand side (sponsorship and structural features) and proceed to discuss the core features and teacher outcomes. First, the analysis indicates that sponsorship has a substantial effect on both the time span and contact hours spent in professional development: on average, SAHE-grantee activities are spread over a substantially longer period of time and involve more hours of professional development than district activities.[33] Sponsorship also has an influence on active learning and collective participation: SAHE-grantee activities are more likely to provide opportunities for active learning, and less likely to be designed for collective participation than district activities; that is, they are less likely to be designed for teachers in school, department, or grade-level groupings. Finally, sponsorship has a direct influence on content focus: controlling for time span and contact hours, SAHE-grantee activities tend to give more emphasis to content than do district activities.

Activity type is somewhat less influential than sponsorship, but, like sponsorship, it has an important influence on duration: reform activities tend to span longer periods and to involve greater numbers of contact hours than traditional activities.

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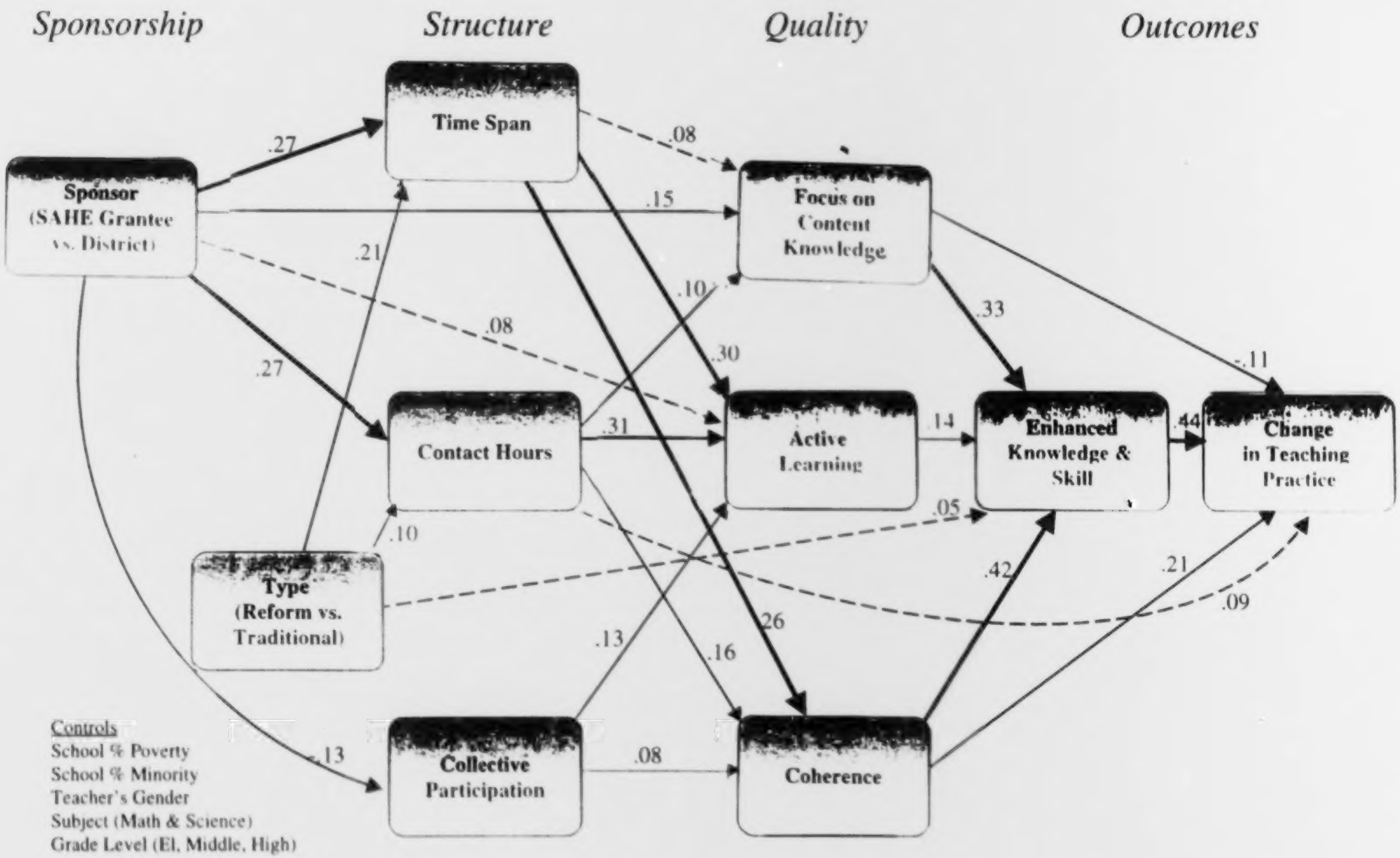
[32] With few exceptions, we found few systematic differences in Eisenhower professional development experiences for teachers in different types of schools or with different characteristics. One teacher characteristic that has a consistent effect is grade level taught. Teachers in secondary schools tend to report participating in activities with less positive quality (for example, fewer opportunities for active learning and less change in teaching practice). See Appendix E.

[33] These and all other results described control for the school and teacher characteristics discussed in the text.

EXHIBIT 3.21

THE RELATIONSHIP OF FEATURES OF PROFESSIONAL DEVELOPMENT TO TEACHER OUTCOMES


Sponsorship
Structure
Quality
Outcomes
Sponsor (SAHE Grantee vs. District)
Time Span
Contact Hours
Type (Reform vs. Traditional)
Collective Participation
Focus on Content Knowledge
Active Learning
Coherence
Enhanced Knowledge & Skill
Change in Teaching Practice
.27
.15
.08
.27
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.44
-.11
.21
.09

Controls
School % Poverty
School % Minority
Teacher's Gender
Subject (Math & Science)
Grade Level (El, Middle, High)
In-field Certification
Teaching Experience

As we expected, our two measures of duration—time span and amount of time—exert a substantial influence on the core features of professional development experiences.[34] Time span and amount of time have a substantial positive influence on opportunities for active learning and coherence. Longer activities tend to include substantially more opportunities for active learning (such as the opportunity to plan for classroom implementation, observe and be observed teaching, review students' work, and give presentations and demonstrations); and they also tend to incorporate more aspects of coherence (including connections to a teacher's goals and experiences, alignment with standards, and professional communication with other teachers). Time span and amount of time also have a moderately positive influence on the emphasis given to content knowledge: activities that span a longer period and last more hours are more likely to focus on mathematics and science content.

The fact that both time span and contact hours have independent effects on our measures of core features suggests that both dimensions of duration are important. Professional development is likely to be of higher quality if it is both sustained over time and involves a substantial number of hours.

As we anticipated, all three of our measures of the core features of activities have a positive influence on enhanced knowledge and skill, as reported by the teachers in our sample. Both content focus and coherence have substantial positive effects on enhanced knowledge and skills, indicating that activities that give greater emphasis to content and that are better connected to teachers' other professional development experiences and other reform efforts are more likely to produce enhanced knowledge and skills.[35] Active learning is also related to enhanced knowledge and skills, but the effect is less strong.

Finally, enhanced knowledge and skills have a substantial positive influence on change in teaching practice: teachers who report enhanced knowledge and skills are likely to report changing their teaching practices as well. In addition, the coherence of professional development activities has an important positive influence on change in teaching practice, over and above the effects of knowledge and skills. This suggests that teachers who experience professional development that is connected to their other professional development experiences, is aligned with standards and assessments, and fosters professional communication, are more likely to change their practice, even among teachers who have gained the same underlying knowledge and skills as a result of their professional development experiences.

These results are very encouraging, for a number of reasons. First, they tend to confirm several of the key assumptions underlying the Title II reauthorizing legislation. For example, our results indicate that sustained and intensive professional development is more likely to be of high quality, as reported by teachers, than is shorter professional development. Our results also indicate that professional development that focuses on academic subject matter, gives teachers opportunities for "hands-on" work, and is integrated into the daily life of the school, is more likely to produce enhanced knowledge and skills.

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[34] The model predicting the core features and teacher outcomes includes sponsorship, the structural features, and all control variables.

[35] When enhancements in knowledge and skills is controlled, content focus has a negative association with changes in classroom practice. We suspect that this result is probably spurious, resulting from the large number of independent variables included in the model predicting change in teaching practice. (The model for change in teaching practice includes all of the structural and core features of professional development, as well as all control variables.) We estimated a model predicting change in teaching practice but omitting knowledge and skills as an intervening variable, and, in that model, content focus has a positive effect.

Second, the results provide insight into the reasons why teachers in SAHE-grantee activities tend to report more positive outcomes than teachers in district activities. In particular, the model indicates that the difference between SAHE-grantee and district activities can be accounted for almost entirely by the fact that SAHE-grantee activities are of substantially longer duration than district activities (both in terms of time span and contact hours), and they give more emphasis to subject matter content. Our results indicate that, when these structural and core features are controlled, sponsorship (SAHE grantee versus district) does not have a direct effect on teacher outcomes.

In addition, our results indicate that the effects of activity type are also largely indirect, operating through duration. Reform activities tend to be of longer duration than traditional activities, and this accounts for nearly all of the positive effects of type.[36]

Finally, our results call attention to the importance of the coherence of professional development activities. Activities that are linked to teachers' other experiences, aligned with other reform efforts, and encouraging of professional communication among teachers appear to support change in teaching practice, even after the effects of enhanced knowledge and skills are included in the model.

SUMMARY AND CONCLUSIONS

In this chapter, we have drawn on our nation sample of teachers who participated in Eisenhower-assisted activities to undertake a number of analyses. First, we have drawn on the data to describe the characteristics of these activities and to assess the extent to which these characteristics reflect the intent of the authorizing legislation and the descriptions of best practice in the literature. Second, we have drawn on the data to examine the degree to which Eisenhower-assisted activities have resulted in enhanced knowledge and skills and improved teaching practices, as reported by the teachers in our sample. We have used our data to identify the relationship between the characteristics of Eisenhower-assisted activities and outcomes for teachers.

Our results indicate that, on the average, supported activities share some but not all of the characteristics of high-quality professional development identified in the literature. Activities supported through the SAHE component of the program tend, on average, to be of substantial duration, and many SAHE-grantee activities focus on mathematics and science content and provide appropriate active learning opportunities for teachers. Some activities supported by the district component of the program also share these elements of high quality, but, on average, district activities tend to be somewhat less consistent with the dimensions of high quality identified in the literature.

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[36] Our results show a modest direct effect of activity type on enhanced knowledge and skills, indicating that reform activities have slightly more positive outcomes when all of the design features and quality characteristics in our model are included.

Many teachers who participate in Eisenhower-assisted activities report enhanced knowledge and skill as a result of participation, as well as changes in teaching practice. This is especially true for SAHE-grantee activities; somewhat fewer teachers in the district component of the program report gains in knowledge and skills or changes in teaching practice.

Our analysis of the relationship between the characteristics of Eisenhower-assisted activities and teacher outcomes indicates that several structural and core features play a strong role in influencing teacher outcomes. In particular, the duration of activities has a strong influence on the degree to which the activities are able to provide high-quality experiences for teachers. Both the time span over which activities are spread and the number of contact hours of professional development provided have a substantial independent influence on the core features of the professional development provided. In addition, the organizational form or type of the activity also has an influence on the core features of the experience provided. On average, reform types of activities, such as mentoring and study groups, tend to provide higher quality experiences than traditional activities, such as workshops, although there is a substantial range of experiences within each type.

Our data indicate that three core features of professional development have an important influence on the extent to which participation enhances teachers' knowledge and skills and leads to improved teaching practices, as reported by teachers in our sample. In particular, positive teacher outcomes are related to the extent to which activities focus on subject matter content, provide active learning opportunities for teachers, and nurture a coherent program of professional development that is connected to other aspects of teachers' work lives.

Finally, the features of professional development we have identified in our model help explain why SAHE-grantee activities have more positive effects, as reported by teachers, than district activities. SAHE-grantee activities tend to have longer time spans and provide more hours of professional development than district activities, and this in turn permits SAHE-grantee activities to give more emphasis to subject matter content, to provide more active learning opportunities, and to strengthen the coherence of teachers' professional development experiences.

To build on this analysis of teachers' report of their experiences in Eisenhower-supported activities, the next chapter turns to an analysis of district coordinators' descriptions of their Eisenhower-supported activities.

CHAPTER 4

DISTRICT "PORTFOLIOS" OF EISENHOWER-ASSISTED PROFESSIONAL DEVELOPMENT ACTIVITIES

School districts shape the use of the majority of Eisenhower Professional Development Program (EPDP) funds; eighty-four percent of Eisenhower funds go to the district component of the program.[1] In the last chapter, we described patterns of teachers' participation in Eisenhower-assisted professional development activities, including teachers' reports of the characteristics and qualities of those activities, and how the activities increased teachers' knowledge and skills and changed their teaching practice. Now we turn to the district's role in shaping teachers' professional development experiences. Teachers' experiences in Eisenhower-assisted professional development activities depend largely on two things: (1) the types of professional development activities districts make available to teachers, and (2) how teachers come to participate in these activities. In this chapter we look at the mix of professional development activities that districts support with Eisenhower funds—their "portfolio" of Eisenhower-assisted activities—and the selection of teachers to participate in these activities.

Provisions of the authorizing legislation guide district decisions about the characteristics of Eisenhower-assisted professional development activities and who participates in them. The Elementary and Secondary Education Act, as amended by the Improving America's Schools Act of 1994, describes the characteristics that districts should strive to incorporate in the professional development opportunities that they provide. In particular, the legislation aims to support "intensive, ongoing professional development programs" (Section 2207(5)(A)) that include "sustained and intensive high-quality professional development" (Section 2101(a)(1)). Congress further directs that local Eisenhower plans be designed in ways that would likely affect teacher practice and "have a positive and lasting impact on the student's performance in the classroom" (Section 2208(d)(1)(E)).

The legislation also provides that Eisenhower-assisted activities should address the needs of teachers of students from historically underrepresented groups (Section 2205(b)(2)(F)). In particular, because of Title I's size and prominence in serving children at risk of school failure, the Eisenhower legislation places a special emphasis on addressing the needs of teachers in schools receiving Title I, Part A funds (Sections 2205(b)(2)(E), 2208(b)(2), and 2208(d)(1)(B)). The Title I statute has a similar provision regarding the Eisenhower Professional Development Program (Section 1119(b)(11)(C)).

In this chapter, we describe how school districts differ from one another in the types of activities that they support with Eisenhower funds. We examine how these activities differ on several of the dimensions of the structural and core features that were related to teacher outcomes in Chapter 3. We also discuss district practices of targeting specific groups of teachers, and the ways that districts select teachers to participate in the activities. Exhibit 4.0 highlights how the issues that we address in this chapter fit into the framework of the entire report.

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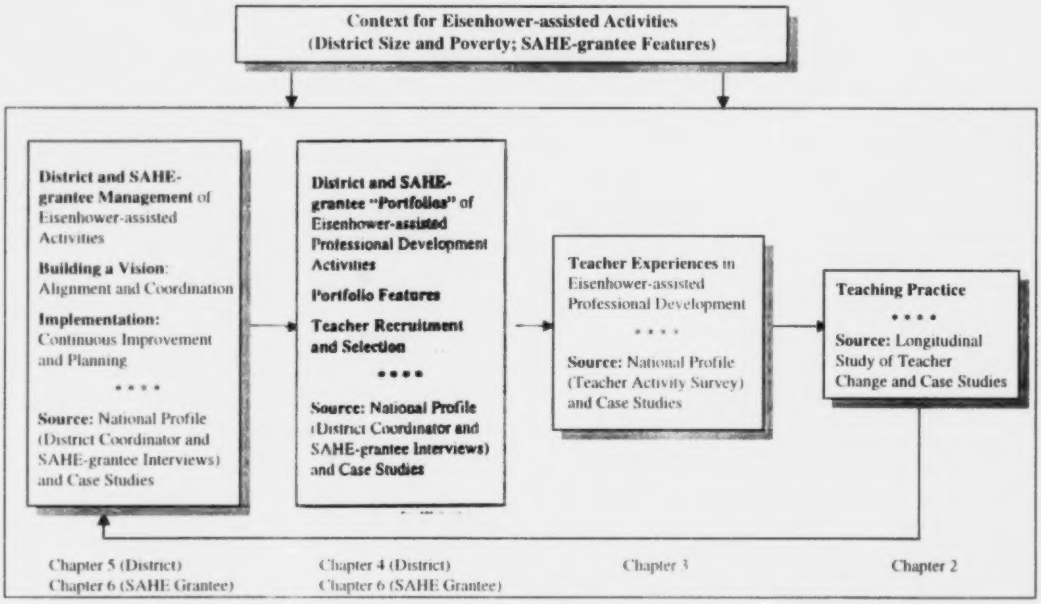
[1] State education agencies (SEAs) receive 84 percent of the total Title II allocation (16 percent goes to State Agencies of Higher Education). Of that 84 percent, SEAs are required to pass on at least 90 percent of the funds to districts; states have the option of using five percent of the funds for administration and five percent for their own programs.

EXHIBIT 4.0

Conceptual Framework for This Evaluation


Context for Eisenhower-assisted Activities
(District Size and Poverty; SAHE-grantee Features)
District and SAHE-grantee Management of Eisenhower-assisted Activities
Building a Vision: Alignment and Coordination
Implementation: Continuous Improvement and Planning
• • • •
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
District and SAHE-grantee "Portfolios" of Eisenhower-assisted Professional Development Activities
Portfolio Features
Teacher Recruitment and Selection
• • • •
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
Teacher Experiences in Eisenhower-assisted Professional Development
• • • •
Source: National Profile (Teacher Activity Survey) and Case Studies
Teaching Practice
• • • •
Source: Longitudinal Study of Teacher Change and Case Studies
Chapter 5 (District)
Chapter 6 (SAHE Grantee)
Chapter 4 (District)
Chapter 6 (SAHE Grantee)
Chapter 3
Chapter 2

While the last chapter described teachers' experiences in Eisenhower-assisted professional development activities, this chapter turns to *similarities and differences across districts* in the professional development activities that districts support. And while the previous chapter described the characteristics of teachers nationwide who participate in Eisenhower-assisted activities, this chapter describes the *similarities and differences across districts* in targeting and recruiting teachers to participate in Eisenhower-assisted activities.

Data Sources

We rely heavily in this chapter on National Profile data from our telephone surveys of a national probability sample of district Eisenhower coordinators. Where appropriate, we supplement these survey data with case-study information regarding district patterns of Eisenhower support for a variety of different types of professional development opportunities and experiences. Our case-study data come from two sources. One source is a series of in-depth case studies that we conducted during the 1997-1998 school year. We chose 10 districts, two from each of five states, to allow variation on state-level reform efforts, the district's approach to professional development, and demographic and geographic characteristics. The second source of case-study data is a series of six exploratory case studies that we conducted during the spring of 1997, also chosen to capture variation on these dimensions.

To obtain the National Profile data we conducted telephone interviews with a national probability sample of district Eisenhower coordinators in the spring of 1998. Through a system of stratified sampling to ensure variation on district poverty level, we randomly drew about 400 districts, giving larger districts a higher chance of being drawn; of these 400, we were able to

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interview 363, which provides us with a response rate of 88 percent (see Appendices A and B for more details about our National Profile and case-study design).

During the telephone interviews, district coordinators reported on professional development activities that occurred during the time period from July 1 through December 31, 1997. As a result, the data referenced and exhibited in this chapter that represent characteristics of specific professional development activities refer to activities that took place during this time period. Questions that do not refer to specific activities, but to general practices (e.g., targeting groups of teachers), apply to the entire 1997-1998 school year. Ten districts in our sample report that they offered no activities over the period from July 1 through December 31, 1997; therefore, analyses in this chapter that apply to particular activities exclude these ten districts, and thus are conducted with a maximum sample of 353 districts.

The probability of a district being selected into our national sample was proportional to the number of teachers in the district. Consequently, all of the results are weighted by the size of the district (i.e., the number of teachers in the district). As a result, our data reflect information according to the percent of teachers in a district. For questions that ask about teacher participation in Eisenhower-assisted activities, we report the number of *participations* rather than the number of *participants.* As a rule, districts are unable to determine whether Eisenhower participants attended multiple Eisenhower-assisted activities. Therefore, a single participant may account for more than one "participation."

Organization of Chapter

In this chapter, we examine district "portfolios" of Eisenhower-assisted professional development activities. The mix of professional development activities that a district supports with Eisenhower funds can be viewed in its entirety as a "portfolio" of Eisenhower-assisted professional development activities. Activity portfolios can differ according to the types and range of opportunities offered, as well as according to the structure and substance, or core, of the opportunities.

For example, district portfolios of professional development activities can place more or less emphasis on particular subject areas; they can include several different kinds of activities or be limited to only one or two; and they can place more or less emphasis on strategies that afford teachers the time to learn complex subject matter and to reflect on and practice what they have learned. Taken together, the activities that comprise the portfolios of professional development activities represent a district's professional development strategy, although the degree to which districts strategically plan their portfolios varies from district to district.

To describe the district Eisenhower portfolio, we divide the chapter into five main sections. The first section examines the subject area focus of Eisenhower-assisted professional development activities. The second section describes districts' patterns of support for "traditional" versus "reform" types of professional development activities, and the other structural and core features of these activities. Workshops and conferences are considered to be "traditional" forms of professional development. Activities that appear to be structured to allow longer duration and greater depth and focus, such as mentoring or committee or task force participation, are considered to be "reform" activities (Little, 1993; Sparks & Loucks-Horsley, 1989). (See Chapter 3 for a detailed discussion of types of activities.) The structural and core features discussed in these sections include the duration of the activity, both in number of contact hours and span of time across days, weeks, or months;

collective participation, or the extent to which groups of teachers or whole schools participate together in the activity; and the types of active learning opportunities that the activities provide to teachers. As part of our examination of district portfolios in this section, we also compare Eisenhower-assisted activities in the district to the district's entire program of professional development.

In the third section of the chapter, we examine district strategies concerning targeting and recruiting teachers into Eisenhower-assisted professional development activities. There is sometimes greater need for professional development for teachers in high-poverty areas, and often district strategies for recruiting these teachers for participation in professional development meet with limited success. In Chapter 3, we showed that teachers from high-poverty schools are only somewhat more likely to participate in Eisenhower-assisted professional development than other teachers. Here we examine district strategies that may explain these participation rates. To address these targeting and participation issues, we focus on: 1) the targeting of Eisenhower-assisted activities toward special populations of teachers, 2) how teachers come to participate in Eisenhower-assisted activities (e.g., whether they volunteer or are selected), and 3) strategies that districts use to increase participation.

Throughout the chapter, we report where the structural and core features of district professional development, and district targeting patterns vary significantly by district poverty level (defined as the number of children living in poverty in the district) and the size of the district (defined as the number of teachers in a district), or both. Differences among variables by size and/or poverty are reported if they are statistically significant at the .05 level. For these analyses, both district poverty and district size are always estimated in the same model, so effects for one always control for the effects of the other. Therefore, any significant size effects are independent of poverty effects, and likewise any significant poverty effects are independent of size effects. Whenever we test for poverty and size differences, we report the findings. If there are significant effects either by district poverty level, by district size, or both, we show this in an exhibit; if the effects of both are insignificant, we report the findings in the text, but do not include an exhibit. Interaction effects between poverty and size are insignificant unless otherwise noted.[2]

We divide poverty into three levels—low (less than 10.9 percent of children in poverty), medium (from 10.9 to 21.4 percent of children in poverty), and high (greater than 21.4 percent of children in poverty).[3] District size is divided into four types—small (districts with less than 250 teachers), medium (districts with between 250 and 1500 teachers), large (districts with greater than 1500 teachers), and consortia. A consortium is a group of districts, ranging in size from several districts to several hundred districts, which can sometimes comprise a substantial portion of a state. To identify consortium status, we asked each sampled district whether or not the district participated in the Eisenhower program through a consortium. If the district indicated that the district participated through a consortium, we then drew the entire consortium into our sample, and adjusted the probability of the consortium being selected into the sample, based on the full set of member districts. In reporting results, we use "district" to indicate district or consortium, unless otherwise noted.

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[2] Means and standard deviations for all of the variables analyzed in this chapter are located in Appendix F, listed by exhibit number. All parameter estimates reported in the chapter incorporate weights reflecting the sampling plan. Reported p-values and the standard errors on which they are based, however, do not reflect the stratification and variance in weights incorporated in the design. Analyses that take these elements of the complex sample design into account have been carried out, and the results are nearly identical to those reported in the chapter.

[3] These categories divide the population equally into thirds.

In the fourth section of the chapter, we summarize and synthesize the findings for district poverty and district size. We discuss how the level of poverty and the number of teachers in a district might affect district Eisenhower portfolios, and targeting and recruiting strategies, and discuss the implications of these findings for the Eisenhower program. The fifth and final section of the chapter summarizes our major findings about district portfolios of Eisenhower-assisted professional development, and discusses implications for district and federal policy.

DISTRICT PORTFOLIOS' EMPHASIS ON MATHEMATICS AND SCIENCE

Section Findings

- *Nearly all teachers are in districts that use Eisenhower funds for professional development activities in mathematics and science. Although a substantial number of districts use Eisenhower funds for activities outside of mathematics and science, particularly language arts and social studies, teacher participation is still mainly focused on mathematics and science activities.*

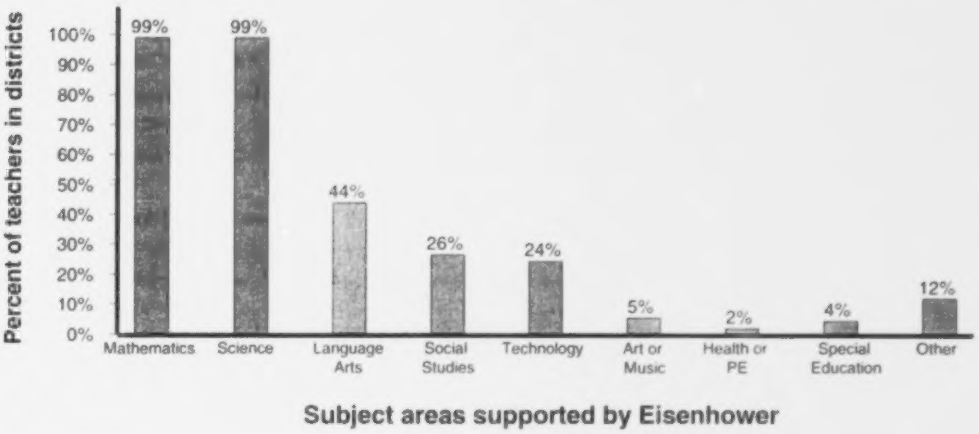
Like its predecessor, the Eisenhower Mathematics and Science Education Program, the reauthorized Eisenhower Professional Development Program focuses primarily on supporting professional development in mathematics and science. But the 1994 reauthorization changed the law to allow districts to use some portion of their Eisenhower funds to support professional development in subject areas outside of mathematics and science. Although the main focus of program-funded activities was to remain mathematics and science, appropriated funds in excess of $250 million could be targeted to other subject areas (Section 2206). During the 1997-98 school year, 22.7 percent of a district's Eisenhower funds could go to support professional development in other subject areas besides mathematics and science. Furthermore, states and districts could apply for waivers from the federal government to allow them to devote larger percentages of their Eisenhower grants to professional development in other subject areas. Ten states and two districts have been granted such waivers. In addition, states may apply to the Department of Education for "ED Flex" status, which if granted, allows states to grant waivers to LEAs that request them. These waivers may apply to Title II or to other federal programs. As of January 1998, twelve states had been granted Ed Flex status by ED: Colorado, Illinois, Iowa, Kansas, Maryland, Massachusetts, Michigan, New Mexico, Ohio, Oregon, Texas, and Vermont. Two of our case districts are located in ED Flex states—Ohio and Texas.

As with other parts of the ESEA, the intent of these provisions was to allow school districts flexibility in using Eisenhower funds; to allow professional development to be responsive to the National Education Goals that call for students to demonstrate competence in all major subject areas; and for professional development to prepare teachers to instruct students in these subject areas. Expanding the Eisenhower program to other subject areas besides mathematics and science was also designed, according to ED officials, to allow districts to keep pace with the standards-based reform movement, which has fostered the development of standards in all major subject areas.

Our national survey of district Eisenhower coordinators indicates that although the primary content focus of Eisenhower-assisted activities continues to be on mathematics and science, some districts have begun to fund professional development in other subject areas as well. We asked district coordinators in which subject areas they support professional development using Eisenhower funds. Exhibit 4.1 illustrates the percent of teachers who are in districts that fund activities in mathematics, science, language arts, and several other subject areas, from July 1 through December 1997. As the Exhibit shows, nearly all teachers are in districts that fund professional development activities in mathematics (99 percent) and science (99 percent). Of the other subject areas, 44 percent of teachers are in districts that use Eisenhower funds for language arts, and 26 and 24 percent of teachers are in districts that use Eisenhower funds for professional development in social studies and technology, respectively. In fewer cases, teachers are in districts that use Eisenhower funds to provide professional development in the arts (five percent), special education (four percent), health and physical education (two percent), and other areas (12 percent) (i.e., vocational education, home economics, foreign language, and activities that are appropriate for multiple subject areas such as pedagogy and early childhood programs).

EXHIBIT 4.1

Percent of Teachers in Districts Using Eisenhower Funds to Support Professional Development Activities, by Subject Area (n=353[4])



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998, reporting on the 1997-1998 school year.
How to read this exhibit: The first bar shows that 99 percent of teachers are in districts that use Eisenhower funds to support professional development in mathematics. Each bar and the number on top of it represent the percent of teachers in districts for each category.

As part of our data collection, we asked Eisenhower coordinators to provide us with lists of the Eisenhower-assisted professional development activities that they offered from July 1 through December 1997, and the number of teachers and other staff who participated in each activity. An analysis of these activity lists confirms the findings from the district coordinator surveys, shown in Exhibit 4.1, that districts support Eisenhower activities in subject areas outside of mathematics and science.

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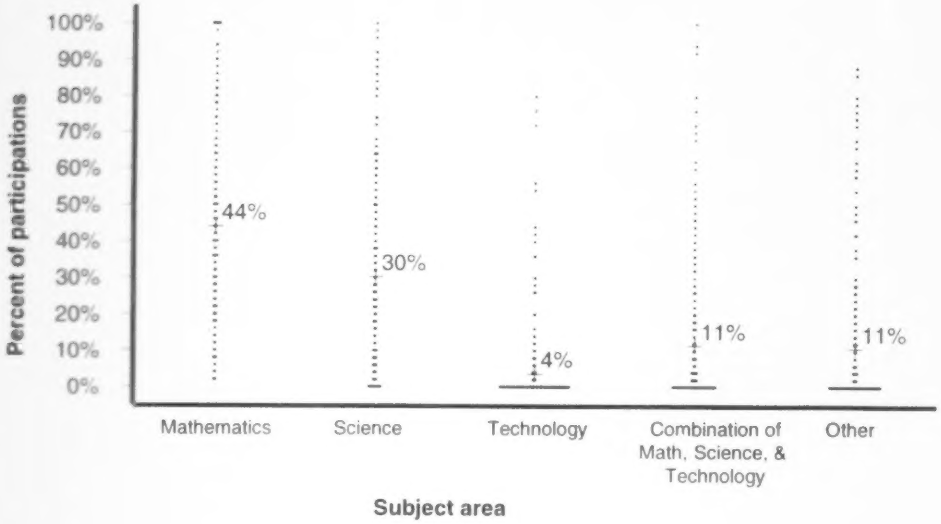
[4] Of our total sample of 363 district Eisenhower coordinators, 10 districts did not use Eisenhower funds to support professional development activities; therefore there were a total of 353 district coordinators answering questions about Eisenhower professional development activities.

Although our survey data and information from the activity lists indicates that districts offer Eisenhower-assisted professional development across a range of subject areas, both sources of information also indicate that teachers participate mostly in mathematics and science-related activities. Results from our survey of Eisenhower coordinators, shown in Exhibit 4.2, illustrate how, for each district, the percent of teacher participations in Eisenhower-assisted professional development activities is distributed across subject areas; the mean percent of participations is listed to the right of each distribution. It is evident from these data that teacher participation is concentrated on professional development focused in mathematics and science. On average, districts report that the highest percent of participations is in mathematics (44 percent) and the second highest is in science (30 percent); 15 percent of participations are in technology alone, or technology in combination with mathematics and science. On average, only 11 percent of Eisenhower-assisted professional development participations are completely outside the areas of mathematics, science and technology.[5] None of these patterns differ significantly according to district poverty level or district size.

EXHIBIT 4.2

Percent of Participations in Eisenhower-assisted Professional Development Activities, by Subject Area (n=312)



Source: District coordinator lists of Eisenhower-assisted activities provided in the district from July 1 through December 31, 1997.
How to read this exhibit: The first distribution shows that on average, districts report that 44 percent of participations in Eisenhower-assisted activities are in mathematics. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of districts for that particular category. The number to the right of the distribution is the mean.

Our case-study data also indicate that the presence of Eisenhower funding in subject areas other than mathematics and science remains quite modest. Furthermore, our district survey and case-study data both suggest that Eisenhower funding is essential for some districts' support of professional development in mathematics and science. All surveyed districts report that Eisenhower funds are important to their ability to provide professional development in mathematics and science, and 45 percent report that "most" or "all" professional development in mathematics and science in their districts is supported with Eisenhower funds (data not shown).[6] Furthermore, administrators in some case-study districts report that professional development in mathematics and science would be neglected without Eisenhower funds.

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[5] We did not collect survey data on the amount of district Eisenhower funds that were used to support professional development in these different subject areas; therefore, we cannot report on the percentage of funds that are spent in subjects other than mathematics and science.

For example, in Northtown, Connecticut, all Eisenhower funds go to professional development in mathematics and science, because the Eisenhower coordinator feels that principals are predisposed to spend all unspecified professional development funds on reading. The coordinator suggests that it is important to set aside some funds to ensure the availability of professional development in mathematics and science. Similarly, in Maple City, Ohio, about 80 percent of the professional development activities conducted by the districts' mathematics and science supervisors is Eisenhower-assisted. The supervisors say that if it were not for Eisenhower funds, their professional development activities in mathematics and science would be "in a dismal state."

In general, case districts use their Eisenhower funds for professional development activities in both mathematics and science. However, some case districts choose to emphasize either mathematics or science rather than divide their Eisenhower funds equally between the two subjects. In Texas, for example, the state's testing program places much greater emphasis on mathematics than on science. Over the course of their school careers, students are tested five times in mathematics, but only once in science. The district coordinator said that the state's emphasis on mathematics through its assessment system led district administrators to focus Eisenhower funds in the area of mathematics, rather than science. Administrators in Rhinestone, Texas, state that the majority of Eisenhower funds are spent on professional development in mathematics, because the district wishes to improve scores on statewide assessments in mathematics. Thus, perhaps because statewide assessments generally are less common in science than in mathematics, some districts may be more inclined to use Eisenhower funds for professional development in mathematics rather than in science.

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[6] The Eisenhower legislation includes a local cost-sharing requirement. At least 33 percent of the cost of district Eisenhower activities must be borne by the LEA from non-Title II sources. These sources may include cash or in-kind contributions, and may come from a variety of sources, including: (1) private, non-federal cash contributions, and (2) release time for teachers, and (3) federal funds. The stipulations on the use of federal funds are (1) that they are used consistently with Title II and the statute under which the funds were appropriated, and (2) that they are used to benefit students and teachers who otherwise would have been served by these funds. Furthermore, the SEA may waive this requirement if the LEA is unable to meet the requirement due to economic hardship, and that the requirement would preclude the LEA's participation in the program (Section 2209). Therefore, the Eisenhower legislation appears to allow Eisenhower funds, combined with other federal funds, to support most or all mathematics or science professional development activities in a district. The legislation also appears to allow Eisenhower funds alone to support most or all mathematics and science professional development activities, if the LEA has obtained a waiver from the cost-sharing requirement. Also, the 1994 legislation no longer includes a requirement that Eisenhower funds must "supplement, not supplant" other funding sources.

In some case districts, however, Eisenhower coordinators report that, without Eisenhower funds, professional development in science would not exist. For example, Eisenhower funds are primarily spent on science activities in East City, New York, where they play a critical role in supporting professional development in science. In East City, the twin goals of literacy and mathematics dominate every school effort. Schools spend an hour every school day on sustained reading, known as the "golden hour." The hour is golden because it is sacrosanct, and cannot be skipped or interrupted. Mathematics receives similar attention; schools spend an hour every school day on mathematics instruction, known as the "silver hour." Locally funded professional development efforts focus on literacy and mathematics as well.

Science, in contrast, is viewed as a luxury in East City, according to district officials. Although districts have science coordinators who organize and conduct professional development activities for the district, local budget cuts have been aimed at these positions. According to district officials, professional development in mathematics receives support from many sources; science now receives reliable support from only one—Eisenhower program funds. Therefore, the district has decided that 90 percent of Eisenhower dollars would fund professional development in science.

Similarly, in Riverside, Washington, Eisenhower funds have been instrumental in a 10-year effort to overhaul the elementary science curriculum, according to interviews with district officials. After a period of planning, the overhaul of the Riverside science curriculum began in earnest in 1990, when many of the district's teachers attended 30-hour classes at a local university. The classes were intended to help teachers understand concepts in the life, earth, and physical sciences. Then, in response to teachers' reported enthusiasm for the courses, some teachers took advanced classes in these concepts over the next few years. By 1993, a core group of about 30-50 teachers was trained and ready to begin creating kits—curriculum units that include instructions and materials to help teach them. Currently, there are three or four kits at each grade level; teachers build some of the kits, and others are purchased from outside sources. Now, professional development in Riverside involves a "train the trainer" model, in which teachers observe classes taught by those teachers who have expertise in the kits. According to the district Eisenhower coordinator, Eisenhower funds have been instrumental in developing the kit-based science curriculum in the district, and in fostering a strategy for professional development in science that is more coherent than the district's approach to professional development in other subjects.

Some of our case districts do use Eisenhower funds outside of mathematics and science. Data from these districts suggest that there may be three general strategies that districts take to using Eisenhower funds in other subject areas. One strategy is to hand over Eisenhower resources to the district-level staff responsible for the particular subject area other than mathematics or science. For example, in Commuteville, Virginia, the district's language arts and social studies specialists received less than five percent of the district's Eisenhower funds to provide professional development in those subjects. The district had plans to substantially increase Eisenhower support for social studies during the following school year, to over 20 percent of the district's Eisenhower budget. District officials say that this would begin to provide a better balance in professional development opportunities, because social studies teachers had less access to professional development than did science teachers.

A second strategy for using Eisenhower funds in other subjects is to provide professional development activities that span multiple subject areas. In Rhinestone, Texas, Eisenhower funds support an activity that focuses on both mathematics and language arts. For the activity, a committee of teachers developed "Starstruck Vocabulary," a set of vocabulary words pertaining to mathematics to be used by teachers at each grade level.

A third strategy is to allow schools, in districts that have delegated responsibility for professional development to schools, to elect to use Eisenhower funds in other subject areas. In Richmond, New York, schools apply for Eisenhower funds from the district, and some schools request funds to support professional development in subject areas other than mathematics or science.

Summary: District Portfolios' Emphasis on Mathematics and Science

This section has demonstrated that while some districts use Eisenhower funds to support professional development in areas other than mathematics and science, the professional development activities that teachers participate in the most are focused on mathematics and science. In 1997-98, almost 23 percent of Eisenhower funds could be used for subjects outside of mathematics and science, and in our sample, approximately 11 percent of teachers are in districts that use Eisenhower funds for non-mathematics or science activities. Our results may indicate fewer non-mathematics or science activities than are truly being implemented because we did not collect information on every non-mathematics/science activity that a district offered. However, if expanding the use of Eisenhower funds to support professional development in subjects other than mathematics and science is intended to help provide more flexibility for school districts, our data suggest that school districts may not be taking advantage of that flexibility. In our previous report on a series of exploratory case studies (Birman, Reeve, & Sattler, 1998) we discussed a number of reasons why this might be the case. One reason is that mathematics and science are the program's traditional focus. A second reason is that the amount of program funding for other subjects, in the absence of a waiver, is insufficient to warrant the shift in focus. Data from our case studies suggest a third reason—that in the perspective of some district administrators, there would be little professional development in mathematics, and even less in science, without Eisenhower funds.

This continuing use of Eisenhower funds to focus on mathematics and science can be considered a positive feature of the program, based on its role in fostering content-focused professional development opportunities. In the last chapter we highlighted the importance of a focus on content in professional development in changing teacher practice, and highlighted literature indicating that professional development that focuses on content knowledge appears to promote student achievement more than "generic" professional development that is not embedded in content. Having a critical mass of funding available in a particular content area over a substantial period of time helps to foster professional development that focuses on content knowledge. The reliability of Eisenhower funding supports districts' ability to engage in long-term planning, and to leverage other funds for professional development (Birman, Reeve, & Sattler, 1998). Thus, the continuity and focus provided by Eisenhower funds appears to have enabled some districts to build the capacity for designing content-specific professional development strategies.

To build on these findings about the subject-matter focus of Eisenhower supported activities, we now turn to a description of district portfolios of Eisenhower-assisted activities.

STRUCTURAL AND CORE FEATURES OF DISTRICT EISENHOWER PORTFOLIOS

Section Findings

- *Nationwide, Eisenhower district coordinators report that almost all school districts use Eisenhower funds to support traditional types of professional development (i.e., in-district workshops and institutes, and out-of-district workshops and conferences). While many districts support reform types of professional development (i.e., study groups, teacher networks, mentoring, committees, internships, individual research projects), teacher participation in these reform activities is generally low.*

- *Some districts rely more heavily on traditional approaches such as workshops, than on other approaches, but districts vary substantially in the characteristics of the workshops that they support. Some districts support workshops of relatively long duration that emphasize collective participation and foster opportunities for active learning. Similarly, reform types of professional development vary in their duration; many districts offer reform types of activities that span less than one month.*

- *Large districts are more likely than others to have a higher percentage of participations in reform activities, and to have activities that span a longer period of time, offer more active learning strategies, and more collective participation.*

- *Almost all districts that offer traditional types of activities use Eisenhower funds to support at least some of them; however, many districts that offer reform types of activities do not use Eisenhower funds to support them.*

The Title II legislation stipulates that Eisenhower-assisted activities should be "sustained and intensive," "ongoing," and of "high quality," but it does not provide detailed guidance regarding the characteristics of activities that districts should fund.

In the last chapter, we examined teacher reports of Eisenhower-assisted activities along a number of dimensions. We examined the structural features of professional development activities—traditional vs. reform types, duration and collective participation—and core features—content emphasis, opportunities for active learning, and coherence. We found that all of these dimensions were associated, either directly or indirectly, with enhanced teachers' knowledge and skills and changes in teaching practice. We continue to use this framework in this chapter, but here we focus on how *district portfolios of activities* offer opportunities for professional development that have the features we found to be associated with teachers' learning and change in teaching practice.

As discussed in Chapter 3, research on teachers' professional development suggests that high-quality professional development is characterized by activities that allow teachers to focus in depth on the content that they are trying to master and on how children learn that content (Cohen & Hill, 1998; Fennema et al., 1996; Hiebert, 1999; Kennedy, 1998; Sparks & Loucks-Horsley, 1989). High quality also is associated with activities that are long in duration, allow teachers an opportunity to practice and reflect upon their teaching, and are embedded in the ongoing work of the school.

Some traditional types of professional development, such as workshops and conferences, are thought to be less likely to have these characteristics (Little, 1993). One reason is that traditional approaches often are isolated from teaching practice and characterized by "one-shot" workshops at which teachers listen passively to "experts" and learn about topics that are not essential to teaching (National Foundation for the Improvement of Education, 1996).

Although teachers sometimes value such workshops or conferences because they increase their awareness or rejuvenate their interest (Knapp, Zucker, Adelman, & St. John, 1991), reform types of professional development such as study groups, teacher networks, mentoring, committees or task forces, internships, and individual research projects appear to have the potential for a stronger impact on teaching practice (Darling-Hammond, 1995, 1997b; Hargreaves & Fullan, 1992; Little, 1993; Richardson, 1994; Sparks & Loucks-Horsley, 1989; Stiles, Loucks-Horsley, & Hewson, 1996). This is because reform types of professional development seem more likely than traditional types to offer opportunity for reflection, in-depth study, and prolonged focus, and thus are more likely to be associated with changes in teacher practice and improvements in student achievement (Sparks & Loucks-Horsley, 1989).

In Chapter 3, we found that these reform activities offer more opportunities for active learning and other core features that reflect high-quality professional development than traditional types of activities do. Our findings in Chapter 3 also indicated that reform types of professional development are more likely to be of substantial duration and allow collective participation, which in turn are related to high-quality core features such as active learning opportunities and a focus on content knowledge. However, according to the teachers in our National Profile, to some extent traditional types of professional development also offer some of these high-quality core characteristics, depending upon their duration and other structural features.

Consequently, in this chapter, we not only describe the district provision and participation rates for traditional and reform types of professional development, but we provide information about the average number of contact hours and span (i.e., in days, weeks, months, or years) of the activities that districts support, and the different types of learning methods used in the activities. In examining the quality of professional development activities in this section, there is one aspect of these activities that we do not focus on directly—their content. We were not able to collect detailed information about activity content from district coordinators because of the wide range of professional development activities that districts provided. Therefore, we focus our discussion on the structural aspects of professional development activities that appear to be related to desirable core features and positive teacher outcomes—whether they are traditional or reform, their average duration and whether they offer opportunities for collective participation. We also present information for one core feature for which we do have district-level information: opportunities for active learning.

The first set of analyses in this section focuses on the districts' use of traditional types of professional development. We then discuss district provision of reform approaches, followed by an analysis of the district's overall strategy of professional development, which compares Eisenhower-assisted activities in the context of the district's complete portfolio of professional development activities.

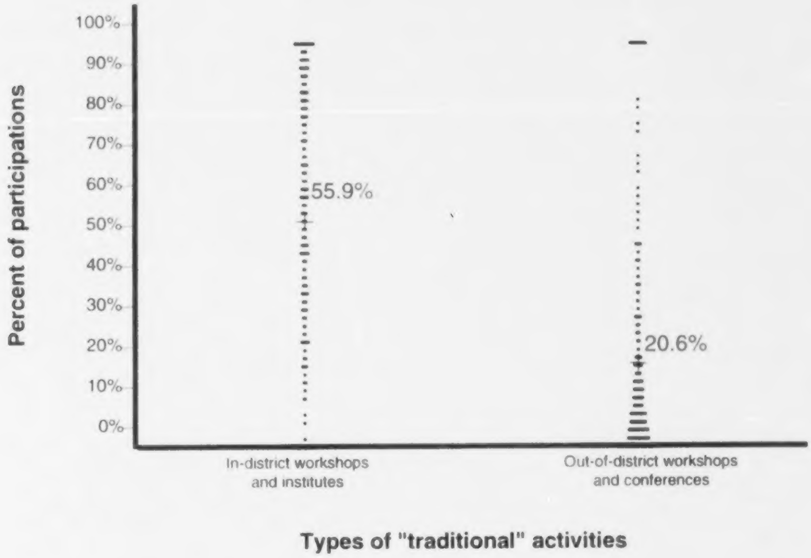
Traditional Types of Professional Development

During our telephone interviews with district Eisenhower coordinators, we asked whether their district supported in-district workshops or institutes from July 1 through December 1997. We then asked whether any of the workshops or institutes were supported, at least in part, with Eisenhower funds. We asked the same questions about out-of-district workshops and conferences. We also asked about a third traditional type of professional development—college courses. But we do not report on this type because the percent of teacher participations in courses supported with Eisenhower funds is negligible. Essentially, Eisenhower funds are very rarely used to support attendance at college courses, according to district coordinators. As we would expect, our findings from our survey of project directors at Institutions of Higher Education (IHEs) indicate that IHEs often use Eisenhower funds to support college courses; consequently, this type of professional development is discussed in Chapter 6, where we present an analysis of our data from IHEs.

On our survey, district Eisenhower coordinators indicated how many participants attended Eisenhower-assisted workshops, institutes, or conferences, counting participants more than once if they attended multiple activities. Exhibit 4.3 demonstrates that, by adding the percent of participations in in-district workshops and institutes and out-of-district workshops and conferences, on average, over three-quarters of total participations in Eisenhower-assisted activities (77 percent) are in these two types of traditional activities, with substantially more participations in in-district workshops and institutes than out-of-district workshops and conferences (56 percent compared to 21 percent, respectively).

EXHIBIT 4.3

Percent of Participations in Traditional Types of Eisenhower-assisted Activities (n=353)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, districts report that 56 percent of participations in Eisenhower-assisted activities are in in-district workshops and institutes. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of districts for that particular category. The number to the right of the distribution is the mean.

While most districts use Eisenhower resources to fund traditional approaches to professional development, districts differ dramatically in the extent of their reliance on these approaches for providing professional development to teachers. Exhibit 4.3 indicates that, on average, districts report that 56 percent of Eisenhower-assisted participations are in in-district workshops and institutes. However, in some districts, *no teachers who participate in Eisenhower-assis*ted activities attend in-district workshops and institutes, while in other districts *all* teachers who participate in Eisenhower-assisted activities attend in-district workshops and institutes. The same variation in distribution is true of out-of-district workshops and conferences.

Our data suggest that most districts rely heavily on traditional forms of professional development in their use of Eisenhower funds. If traditional types of professional development are less likely to be "sustained and intensive," then most districts are not using Eisenhower funds in line with the intent of the provisions of the 1994 reauthorization. However, it is clear from the last chapter that traditional types of professional development activities can vary in their structure and substance. Further, districts may have more participations in traditional than in reform types of activities, but the extent to which this represents disproportionate spending is not clear, given that reform activities may be more expensive per participant than traditional activities.

Next we delve more deeply into districts' support of traditional types of professional development activities by examining structural and core features of these activities—specifically the duration and extent of opportunities for collective participation, and opportunities for teachers to engage in active learning in traditional professional development activities. These analyses help to demonstrate whether and how districts differ in the quality of traditional types of professional development activities that they support with Eisenhower funds.

The Structural and Core Features of Traditional Activities

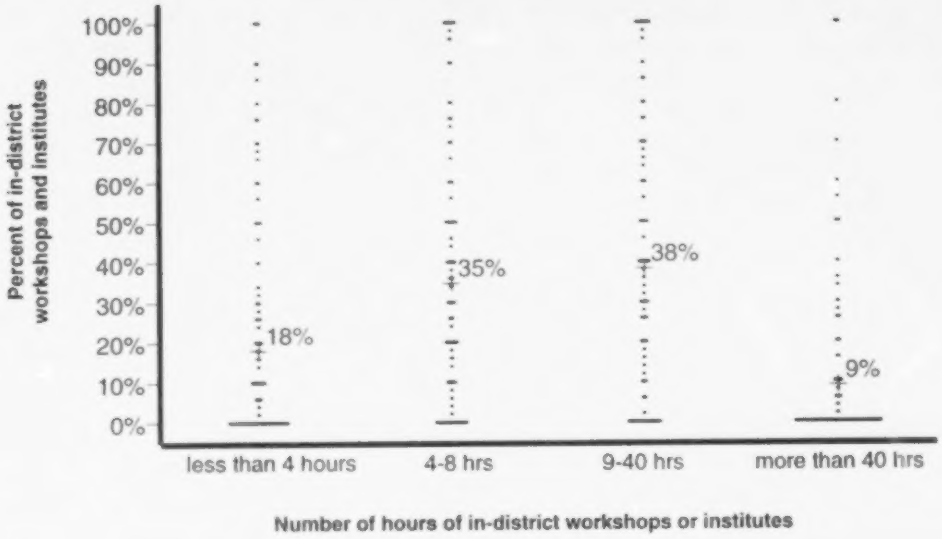
As discussed in Chapter 3, certain structural features are associated with desirable core features of professional development activities, which in turn are associated with improved teacher outcomes. Specifically, the duration of the activity, which includes both the number of contact hours and the time span over which the activity extends (i.e., the number of days, weeks, months, or years across which the activity is spread), as well as the combination and number of types of active learning used in the activity, are indications of high-quality professional development (Cohen & Hill, 1998; Sparks & Loucks-Horsley, 1989).

The fact that many school districts rely heavily on in-district workshops in their Eisenhower-assisted activities could be cause for concern, since such workshops often are assumed to be short experiences that are disconnected from ongoing teacher practice (National Foundation for the Improvement of Education, 1996). The Eisenhower legislation's language that professional development activities be "sustained and intensive" implies that high-quality professional development should involve a relatively large investment of time and should be spread over a long period of time. Sustained, intensive professional development activities would allow teachers opportunities to absorb complex content, practice new techniques in their own classrooms, and discuss their experiences with other teachers. Short, "one-shot" workshops would not generally provide teachers such opportunities.

Duration. Data from our national survey of district Eisenhower coordinators suggest, however, that in-district workshops are not always "one-shot" events.[7] We asked district coordinators to report on the percentages of in-district workshops and institutes that lasted varying numbers of hours, including follow-up events. As shown in Exhibit 4.4a, coordinators indicated *what percent of Eisenhower-assisted workshops or institutes* lasted less than four hours, between four and eight hours, between nine and 40 hours, and more than 40 hours.

EXHIBIT 4.4a

Percent of Eisenhower-assisted In-district Workshops and Institutes, by Contact Hours (n=314[8])



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, 18 percent of Eisenhower-assisted in-district workshops and institutes last for less than four hours. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of districts for that particular category. The number to the right of the distribution is the mean.

The range observed across districts on these measures suggests that districts vary greatly in terms of the number of hours of their workshops or institutes. For all four categories of total hours, the minimum reported was zero percent and the maximum reported was 100 percent. In other words, there are districts in which *all* in-district workshops and institutes last less than four hours, and there are districts in which *no* workshops or institutes last less than four hours; and this pattern applies to the other three time categories as well.

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[7] We did not ask district coordinators about the duration of out-of-district workshops or conferences. Based on data collected during pilot-testing of the survey instrument, out-of-district workshops and conferences all were assumed to las less than one month. Therefore the analyses on the quality of traditional professional development activities focuses on in-district workshops and institutes.

[8] Of our total sample of 363 district Eisenhower coordinators, 314 provided Eisenhower-assisted in-district workshops and institutes; therefore all analyses that pertain to in-district workshops and institutes have a sample of 314.

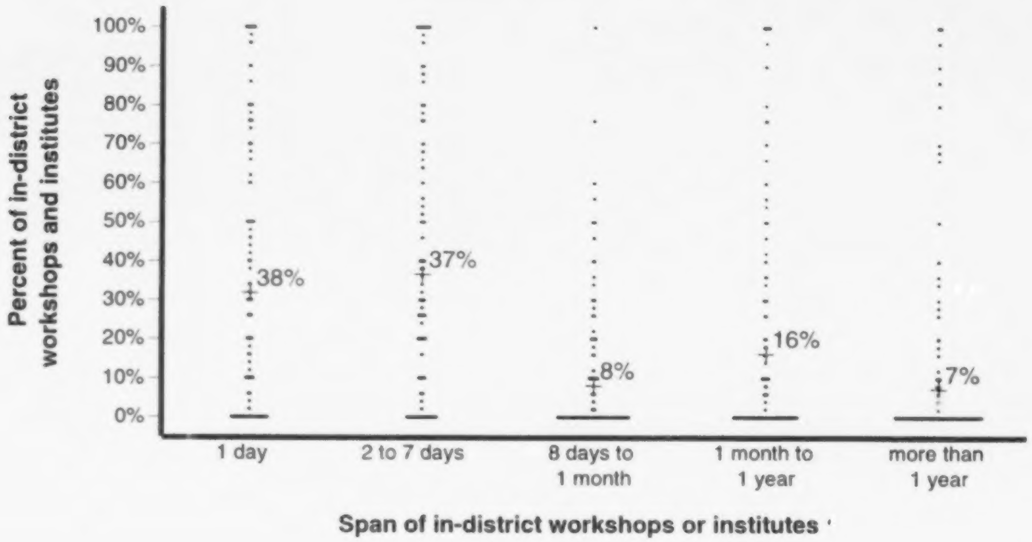
Given this range of findings, it is clear that some districts support workshops that seem to meet the high-quality professional development criterion of "sustained and intensive." It is also clear that most districts do not.

In addition to asking about the number of contact hours of in-district workshops and institutes, we asked Eisenhower coordinators to report the percent of their Eisenhower-assisted workshops or institutes, including follow-up activities, that were spread across different time periods. The options were one day, two to seven days, eight days to one month, one month to a year, and more than a year.

Exhibit 4.4b shows that district coordinators report that many in-district workshops and institutes span a relatively short period of time. Some districts, however, support workshops and institutes that span a relatively long period of time. These findings demonstrate that, as with the number of hours, span across time in days, weeks and months varies considerably from district to district. As Exhibit 4.4b shows, districts that support in-district workshops and institutes report that more than three-quarters of their workshops extend over less than one month.

EXHIBIT 4.4b

Percent of Eisenhower-assisted In-district Workshops and Institutes, by Time Span (n=314)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, 38 percent of in-district workshops or institutes last for one day only. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of districts for that particular category. The number to the right of the distribution is the mean.

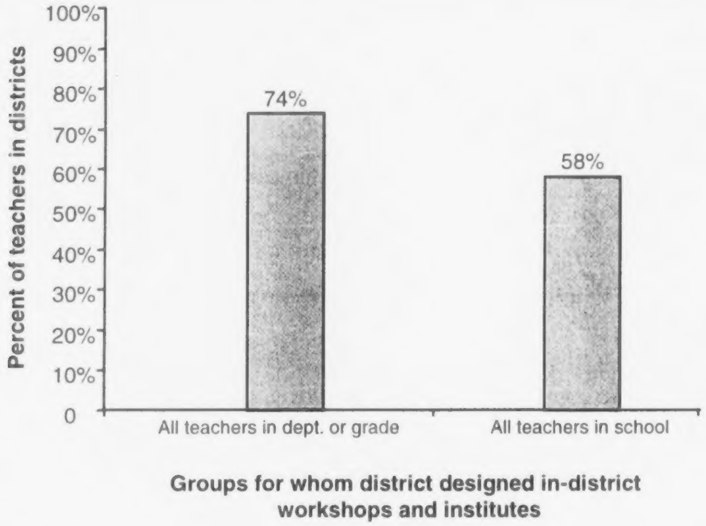
Although we do not have information about the quality of the learning that takes place in these activities, they would seem to lack the "sustained" characteristic associated with high-quality professional development. At the same time, almost a quarter of Eisenhower in-district workshops and institutes span over a month or more. Given the common perception of workshops as very short learning opportunities, this is perhaps a surprising finding. It should be noted that in the early 1990s, districts were providing Eisenhower-assisted activities of shorter duration than they are presently—a median of six hours compared to the current median of 15 hours (Knapp et al., 1991). Thus, since the 1994 reauthorization of ESEA and its emphasis on "sustained and intensive" activities, districts have increased the duration of the professional development activities that they provide.

Collective participation. In addition to being too short, both in number of contact hours and time span, traditional professional development also has been criticized as being geared too little toward developing approaches that allow teachers to work together over time and exchange information to enhance their teaching of a subject area (Little, 1993). While high-quality professional development should meet the learning needs of individual teachers, systemic reform emphasizes that teachers in the same school or who teach the same subject ought to have consistent knowledge bases and approaches to teaching and learning (O'Day & Smith, 1993). Collective participation by whole schools, a critical mass of teachers, or particular groups of teachers in a school allows teachers to share effective practices and reinforces new ideas and methods (Newmann et al., 1996); it also provides opportunities for teachers to discuss issues, and offers them a basis for comparing and choosing alternative practices (Ball, 1996). Our study of teachers, reported in Chapter 3, suggests that collective participation in professional development, which offers the opportunity to foster a common body of knowledge among teachers, is associated with teachers' self-reported enhanced knowledge and skills. Further, the authorizing legislation acknowledges its importance by specifying that districts can use Eisenhower funds to support professional development geared not just toward individual teachers' needs but also toward the needs of groups of teachers (Section 2210(b)(3)(A)).

To measure this idea of collective participation, or the extent to which districts provide opportunities for in-district workshops designed for groups of teachers or all teachers in a school, we asked Eisenhower coordinators for whom they designed their workshops. Coordinators indicated whether workshops and institutes were specifically designed for: 1) all teachers in department or grade-level groupings and/or 2) all teachers in a school or set of schools, as opposed to being designed for teachers as individuals or teachers as representatives of their departments, grade level, or school.

Exhibit 4.5a shows that almost three-quarters (74 percent) of teachers are in districts that design in-district workshops and institutes for all teachers in a department or grade, while 58 percent of teachers are in districts that design workshops for all teachers in a school or set of schools. However, while most districts report that they use Eisenhower funds to support workshops and institutes that provide opportunities for collective participation, we do not have data about how frequently districts support workshops and institutes that offer such opportunities.

EXHIBIT 4.5a
Percent of Teachers in Districts in Which Eisenhower-assisted In-district Workshops and Institutes Include Collective Participation (n=314)

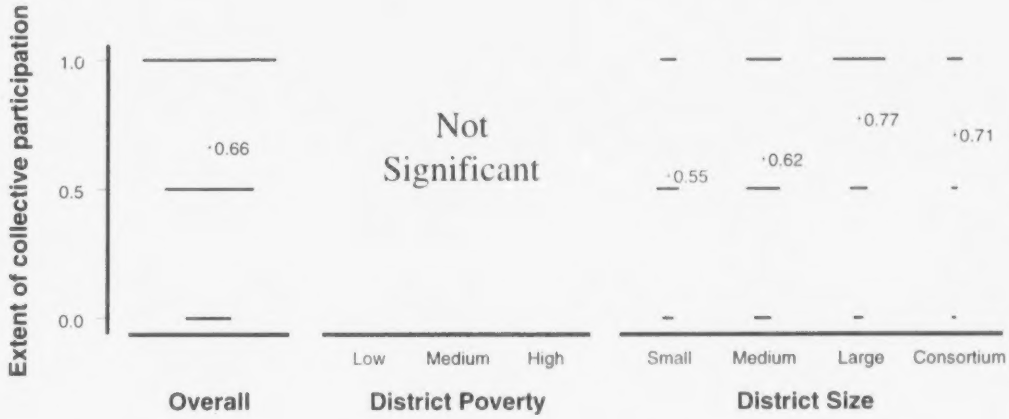


Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 74 percent of teachers are in districts that design in-district workshops and institutes for all teachers in a department or grade level. Each bar and the number on top of it represent the percent of teachers in districts for each category.

We combined and averaged responses to these two questions to create an index of the extent to which districts provide opportunities for collective participation in professional development activities that go beyond the needs of individual teachers; the scale is from zero to one, where zero indicates no opportunities for collective participation, .5 indicates one opportunity for collective participation, and one indicates opportunities for both types of collective participation. Exhibit 4.5b illustrates that while collective participation opportunities do not vary by the poverty level of the district, large and medium districts are significantly more likely to design in-district workshops to offer collective participation than are small districts. Smaller districts may not have enough teachers across grade levels or departments to justify designing activities for them. Also, compared to small districts, large districts may have more funding sources for professional development and therefore have more resources to serve whole schools or large groups of teachers.

EXHIBIT 4.5b

Collective Participation in Eisenhower-assisted In-district Workshops and Institutes, Overall and by District Poverty and District Size (n=314)



	Significant Pairwise Contrasts
Size	Small vs. Medium, Small vs. Large

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, districts report a collective participation score of .66 where zero indicates no opportunities for collective participation in in-district workshops and institutes and one indicates that the district offers both types of collective participation in in-district workshops and institutes. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of the number of opportunities for collective participation that districts offer in their in-district workshops and institutes. The number to the right of the distribution is the mean.

Opportunities for active learning. Workshops vary not only in their duration and opportunities for collective participation, but also in the types of opportunities they provide for teachers to practice what they have learned. Active learning is an important dimension of the quality of professional development, as we demonstrated in Chapter 3. While the term "workshop" may evoke the image of a relatively traditional learning format, workshops can vary along this dimension. "At their best, [workshops] provide adult learners with important and relevant new knowledge and opportunities to try new ideas, practice new behaviors, and interact with others as they learn" (Loucks-Horsley, Hewson, Love, & Stiles, 1998, p. 88). For any type of activity, active learning opportunities are critical to allow teachers to reflect, discuss, and practice new ideas and methods (Carey & Frechtling, 1997; Carpenter et al., 1989; Darling-Hammond, 1997b; Lieberman, 1996; Schifter, 1996). Although the extent of in-depth, reflective learning depends to a large extent on the content of the curricula, the use of active learning strategies provides one measure of the opportunity for such conceptual learning.

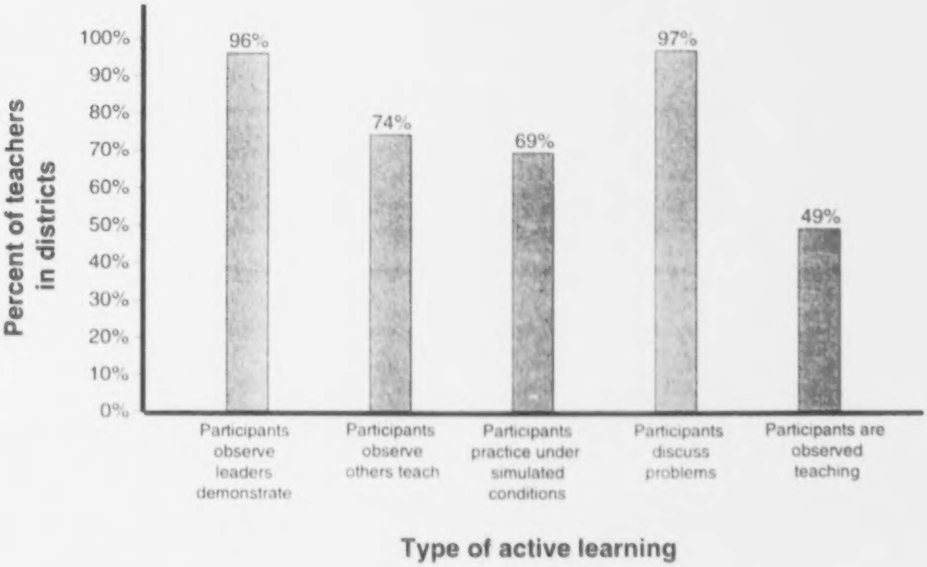
To find out about the opportunities for active learning that in-district workshops and institutes offer to participants, we asked district Eisenhower coordinators which of the following strategies were used regularly in Eisenhower-assisted workshops or institutes to help teachers implement new skills:

- observe professional development providers demonstrating or modeling skills,
- observe other teachers teaching,
- practice under simulated conditions with feedback,
- meet in groups to discuss problems in implementation, and
- be observed teaching in his or her own classroom.

Exhibit 4.6 shows the relative frequency with which districts report using each of these strategies in their in-district workshops and institutes. As the exhibit illustrates, virtually all districts report that they use Eisenhower funds to support workshops in which teachers have to meet in groups to discuss problems with the implementation of new practices and to observe professional development providers demonstrating skills.

EXHIBIT 4.6

Percent of Teachers in Districts That Provide Each of Five Types of Opportunities for Active Learning in Eisenhower-assisted In-district Workshops and Institutes (n=314)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 96 percent of teachers are in districts that offer in-district workshops or institutes that provide opportunities for participants to observe the workshop leader demonstrating or modeling skills. Each bar and the number on top of it represent the percent of teachers in districts for each category.

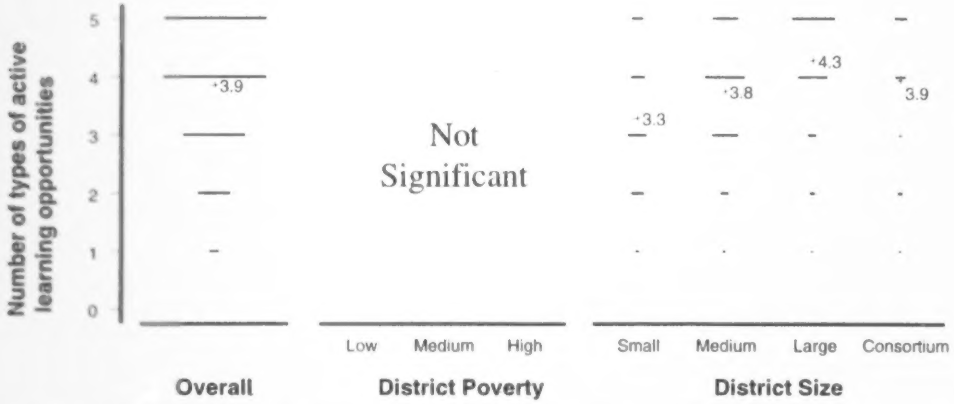
As Exhibit 4.6 shows, fewer districts use Eisenhower funds to provide the other three types of active learning opportunities. Almost three-quarters (74 percent) of teachers are in districts in which district coordinators report that in-district workshops and institutes allow participants to observe others, and almost 70 percent are in districts that report that the workshops and institutes provide opportunities to simulate practice. However, only about half of teachers are in districts (49 percent) that support workshops and institutes that include opportunities to have teachers observed teaching in their own classrooms, perhaps the strategy most likely to relate to change in teacher practice. Since this part of the survey specifically asked coordinators to indicate which activities were conducted "regularly" in workshops, these data provide an approximate measure of the frequency and/or prevalence of these opportunities for active learning in the workshops, from the perspective of district Eisenhower coordinators.

To examine how varied a district's workshop learning methods are, we developed a scale that represents each district's provision of active learning opportunities for teachers in Eisenhower-assisted in-district workshops and institutes. The scale is a composite that combines the five strategies for active learning (i.e., observe leaders demonstrate, observe other teachers, simulate practice, discuss problems with the implementation of new techniques, and have their own practice observed).[9]

Exhibit 4.7 shows on average how many of these five relative types of opportunities for active learning districts report using during in-district workshops and institutes. By and large, district coordinators report that Eisenhower-assisted workshops and institutes provide teachers with four of the five types of learning opportunities.

EXHIBIT 4.7

Number of Types of Opportunities for Active Learning in Eisenhower-assisted In-district Workshops and Institutes, Overall and by District Poverty and District Size (n=314)



	Significant Pairwise Contrasts
Size	Small vs. Medium, Small vs. Large, Small vs. Consortium, Medium vs. Large

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, districts report that they offer 3.9 types of opportunities for active learning in their in-district workshops and institutes. The number of types of opportunities for active learning differs significantly by district size, but not by district poverty level. Each dot represents one district. As the number of districts at one data point increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of the number of opportunities for active learning for that particular category. The number on the distribution is the mean.

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[9] See Appendix D for more details about the scale's composition and reliability.

However, Exhibit 4.7 also indicates that the larger the district, the more likely the district is to provide Eisenhower-assisted activities that are characterized by multiple opportunities for active learning. Small districts provide significantly fewer opportunities for active learning than medium or large districts or consortia, and medium districts provide fewer active learning opportunities than large districts. Here consortia outperform small districts, and, as with collective participation, large districts outperform small districts.

Case-study Examples of District Support for Traditional Types of Professional Development

Consistent with our data from teachers reported in Chapter 3, the data from district coordinators presented so far indicate that most school districts continue to rely heavily on traditional types of professional development. For the most part, these activities last less than eight hours and extend over a span no greater than a week. These results appear to indicate that most districts have a way to go in order to meet the intent of the 1994 reauthorization to provide "sustained, intensive" professional development. However, we do not know the proportion of Eisenhower funds that districts spend on traditional types of activities; since reform approaches to professional development may be more expensive per participant than traditional approaches, a district may have more participations in traditional activities, but spend a higher proportion of funds on reform activities.

Further, while most teacher participations are in traditional types of professional development with short durations, the data from district Eisenhower coordinators also indicate that some districts are able to use their Eisenhower funds for traditional professional development activities that have features of high quality.

Our case-study data illustrate how traditional types of professional development can have characteristics of high quality. In Rainforest, Washington, a small, rural district, all Eisenhower funding goes to support one major professional development activity each year: a science institute. The institute employs a fairly traditional format—five days of classes during the summer. However, it extends over the subsequent school year through in-class observations, modeling, and coaching of teachers by the district's science coordinator, a well-respected leader in her field. The institute also is characterized by collective participation, since all science teachers in the district—that is, all elementary teachers as well as high school science teachers—are expected to participate. Thus all teachers who teach science in the district's schools will have shared the same learning experience. This is an example of how one district is able to use Eisenhower funds for professional development that has a traditional format, but has features of high-quality professional development.

East City, New York, is another example of a district that invests Eisenhower funds in professional development activities that have a traditional format, but with features of high quality. The primary activities supported by Eisenhower funds in this large, urban district are grounded in the district's "partnerships" with cultural and science-related institutions. Institutions such as the local botanical gardens and the local zoo have relationships with the district to support science education, and the associated professional development, for teachers in selected schools. The teachers in the schools participate in these activities only if the school itself has demonstrated sufficient administrative support for the partnership, illustrating how the activities are linked to collective participation.

The partnership with the local zoo is characteristic of the district's approach. The zoo provides multi-session summer workshops lasting 21 to 36 hours, a traditional type of professional development that extends over a much longer-than-average time period. This workshop introduces teachers in selected schools to a full curriculum related to the zoo's exhibits and activities; thus, the workshops focus on particular schools and emphasize collective participation. Furthermore, the summer workshop is followed up throughout the school year by visits from zoo staff, and access to teaching materials and programs for students.

The examples of Rainforest and East City illustrate how two districts, one a small rural community, and the other a large urban area, have used substantial proportions of their Eisenhower funds to support traditional types of professional development—workshops and institutes—that have features of high-quality professional development. In particular, the activities extend over a longer-than-typical time period, are geared toward collective participation, and, in Rainforest, build in opportunities for observation of teaching practice and coaching. While our survey data indicate that districts that use most of their funding for these types of activities are not the norm, these cases also illustrate that such uses of Eisenhower funds can occur.

Reform Types of Professional Development

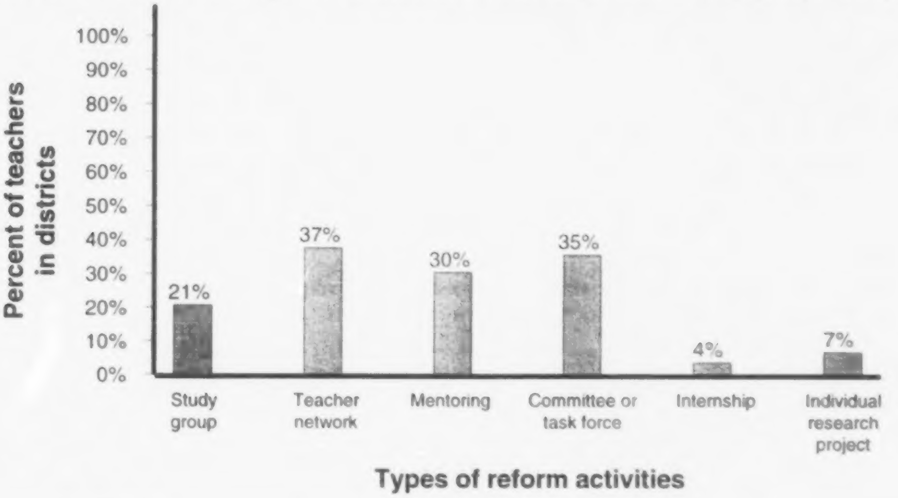
We now turn from traditional types of professional development to discuss districts' use of Eisenhower funds to support reform types of professional development. As discussed earlier in this report, some types of professional development have features that make them particularly compatible with systemic reform, because they appear to afford teachers the opportunity to learn content knowledge in greater depth than more traditional types of professional development and give teachers more of an opportunity to reflect on what they have learned. These types of professional development also may afford teachers the opportunity to work together and learn from one another so that they have common understandings about content, and teaching and learning (O'Day & Smith, 1993). Finally, these reform types of professional development also might be more embedded in ongoing activities, so they are more integrated into the daily life of schools than more traditional types of professional development (Elmore, 1996; Little, 1993).

In this part of the chapter we examine how districts differ in their use of Eisenhower funds to support the following reform types of professional development, as defined in Chapter 3: teacher study groups, teacher collaboratives or networks, mentoring, committees or task forces, internships, and individual research projects. We asked about an additional type of professional development—teacher resource rooms. But this reform type of professional development is not discussed in the analyses in this chapter because the percent of teachers who participate in such resource rooms is very small (i.e., .04 percent). Our data show that teacher resource rooms are the least likely professional development activity to be offered to teachers as part of a district's Eisenhower-assisted professional development portfolio. Therefore, we focus on the other six types of reform activities.

Exhibit 4.8a shows that, according to our national sample of district Eisenhower coordinators, only a minority of teachers are in districts that offer each of the reform types of professional development, and districts vary substantially in which types of reform professional development they support with Eisenhower funds. During our telephone interviews, we asked Eisenhower coordinators whether their district supported participation in each type of reform activity, from July 1 through December 1997, and then asked whether each activity, at least in part, was supported with Eisenhower funds. As Exhibit 4.8a illustrates, over one-third of teachers (37 percent) are in districts that use Eisenhower funds to support teacher networks, mentoring or coaching, and committees or task forces. A smaller percent of teachers are in districts that support study groups (21 percent), internships (four percent) and individual research projects (seven percent). Thirty-five percent of teachers are in districts that do not support any type of reform activity (results not shown).

EXHIBIT 4.8a

Percent of Teachers in Districts That Support Reform Types of Professional Development Activities with Eisenhower Funds (n=353)



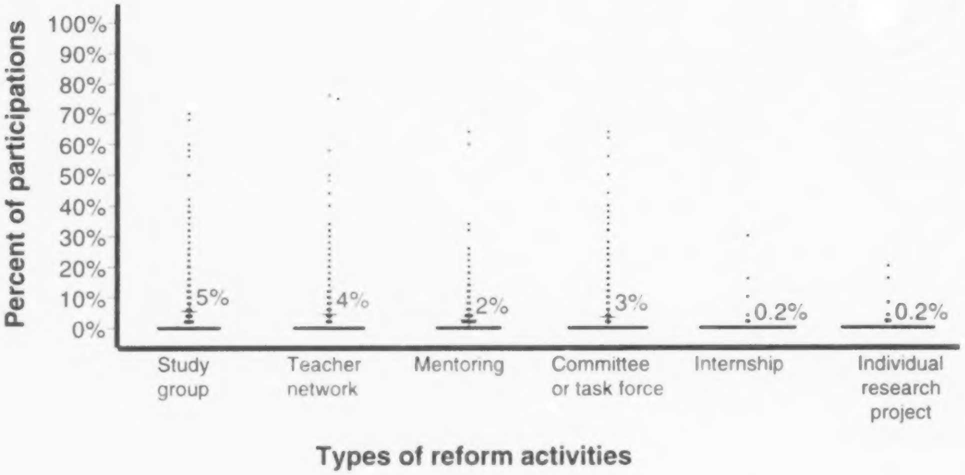
Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 21 percent of teachers are in districts that use Eisenhower funds to support teacher study groups. Each bar and the number on top of it represent the percent of teachers in districts for each category.

Although nearly two-thirds of teachers are in districts that are trying reform activities (data not shown), relatively few teachers participate in them. We asked coordinators to tell us the number of teachers that Eisenhower funds supported to participate in each type of reform activity, from July 1 through December 1997. As Exhibit 4.8b shows, according to district Eisenhower coordinators nationwide, none of the six reform types of professional development activities accounts for an average of more than five percent of all participations in all Eisenhower-assisted activities. Although an average of four percent and seven percent of teachers are in districts that *offer* internships and individual research projects, respectively (as illustrated in Exhibit 4.8a), Exhibit 4.8b shows that average teacher *participations* in these activities is less than one-half of one percent. As we suggested earlier, however, the number of participations in reform approaches may not reflect the proportion of funds devoted to these reform types of activities.

Exhibit 4.8b also illustrates that some districts rely much more heavily than others on these reform types of activities. Some districts report that the majority of teachers who participate in Eisenhower-funded activities participate in reform types of professional development. For example, some districts report as many as 60 to 70 percent of Eisenhower-assisted participations on teacher committees or in study groups. However, many districts have participations well below the average, including districts that have no participations in any reform activities.

EXHIBIT 4.8b

Percent of Participations in Reform Types of Eisenhower-assisted Professional Development Activities (n=353)



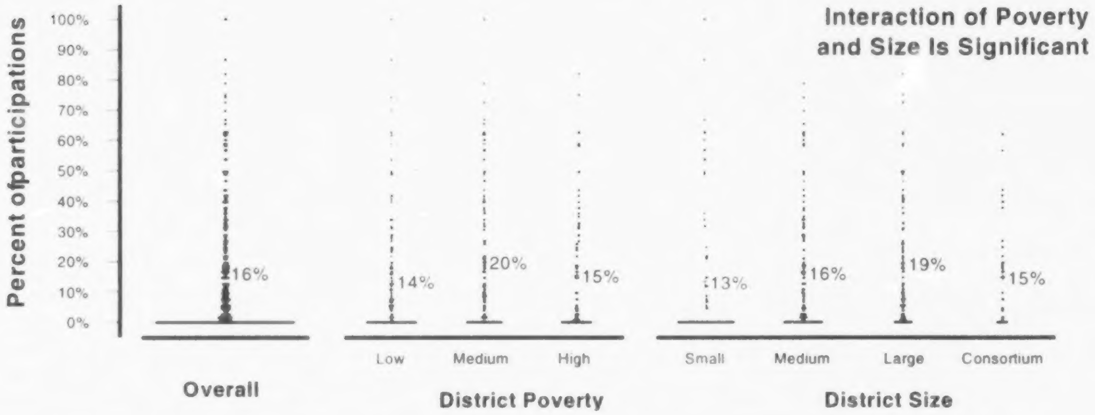
Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, districts report that five percent of participations in Eisenhower-assisted activities are in study groups. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of districts for that particular category. The number to the right of the distribution is the mean.

Adding the total number of participations in all six of the reform types of professional development provides a measure of the proportion of Eisenhower-assisted participations in reform versus traditional approaches to professional development. Exhibit 4.9a shows that the district average for teacher participations in reform types of professional development is 16 percent. There is substantial variation on this measure, however; a few districts have close to half of total participations in reform approaches, while many others have no participations in reform approaches. Further, the interaction effect between poverty and size is significant.

The main message illustrated by the interactions in Exhibit 4.9b seems to be that while high- and medium-poverty districts have more participations in reform activities as the size of the district increases, low-poverty districts have the same relatively low percent of participations in reform activities regardless of the size of the district. Reform participations in consortia mirror the pattern in large districts, except in high-poverty districts, where consortia have fewer participations in reform activities than do large districts.

EXHIBIT 4.9a

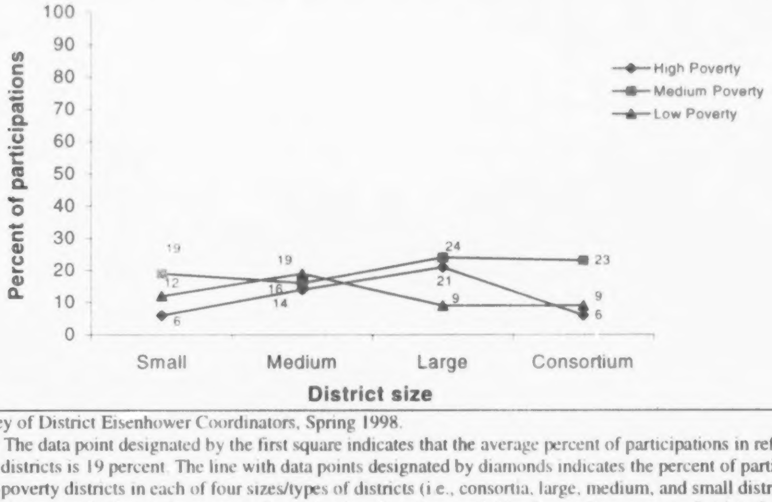
Percent of Participations in Reform Types of Eisenhower-assisted Professional Development Activities, Overall and by District Poverty and District Size (n=353)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, districts report that 16 percent of all participations are in reform types of professional development. The interaction effects of district poverty and size on the percent of participations in reform activities are significant. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of districts for that particular category. The number to the right of the distribution is the mean.

EXHIBIT 4.9b

Percent of Teacher Participations in Reform Types of Professional Development Activities, Interaction of District Poverty and District Size (n=353)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The data point designated by the first square indicates that the average percent of participations in reform activities in medium-poverty small districts is 19 percent. The line with data points designated by diamonds indicates the percent of participations in reform activities for high-poverty districts in each of four sizes/types of districts (i.e., consortia, large, medium, and small districts); the line with data points designed by squares indicates the percent of participations in reform activities for medium-poverty districts for each of the four sizes/types of districts; and the line with data points designated by triangles indicates the percent of participations in reform activities in low-poverty districts for each of the four sizes/types of districts.

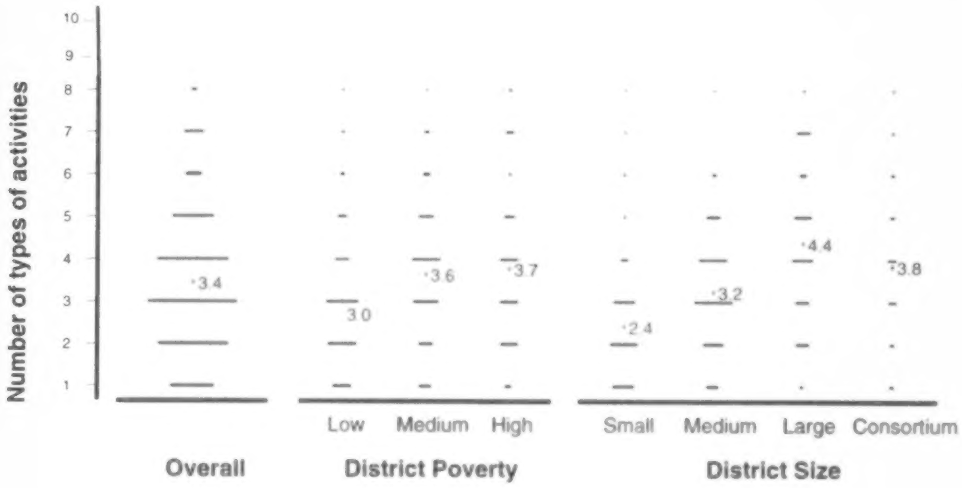
This may reflect the fact that large districts are more likely to have teachers available who have the time to participate in reform activities, which sometimes span a longer period of time than traditional activities; that is, large districts are more likely to have department leaders and/or curriculum specialists or other positions that do not require 100 percent classroom time, whereas districts with smaller numbers of teachers may be less likely to have these positions. The findings also may reflect the fact that reform activities typically cost more per teacher than traditional activities. Large districts may have more resources available per teacher, in addition to benefiting from economies of scale, both of which might enable them to offer more reform activities, compared to smaller districts. Low-poverty districts generally do not provide many opportunities for participation in reform activities, possibly because, on average, their students perform better than in other districts. As a result, low-poverty districts may not feel the need to offer reform approaches to professional development.

The total number of types of activities that a district funds is another measure of a district's portfolio of professional development activities. This measure reflects a district's emphasis on reform types of professional development and allows us to compare how districts vary in their support of these types of professional development. Since almost all districts support the two traditional types of professional development activities (i.e., in-district workshops and institutes, and out-of-district workshops and conferences), the larger the number of types of activities that the district supports, the more likely it is that they are supporting reform types of professional development activities. Exhibit 4.10 shows the percent of teachers in districts reporting that they use Eisenhower funds to support different numbers of types of activities. We created this measure by adding the number of types of activities that district coordinators said that they supported, at least in part, with Eisenhower funds, from July 1 through December 31, 1997. Of a possible ten types of activities (the two traditional and six reform that we address in this chapter, plus courses and teacher resource centers), districts support an average of 3.4 types of activities with Eisenhower funds. Three percent of teachers are in districts that support only one type of activity (data not shown).

Consistent with our previous findings on across-district variation, some districts use Eisenhower funds to support very few types of activities during the time period in question, while some support as many as eight of the different types. Further, low-poverty districts have significantly fewer types of activities than medium- or high-poverty districts. In addition, as one would expect, small districts support fewer types of activities than either medium or large districts or consortia, and medium-sized districts support fewer activities than large districts. Perhaps the higher the poverty, the greater the perceived need to experiment with multiple and new forms of professional development; and the larger the district, the greater capacity to do so.

EXHIBIT 4.10

Number of Types of Eisenhower-assisted Activities, Overall and by District Poverty and District Size (n=353)



	Significant Pairwise Contrasts
Size	Small vs. Medium, Small vs. Large, Small vs. Consortium, Medium vs. Large
Poverty	Low vs. Medium, Low vs. High

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, districts report that they offer 3.4 out of a possible 10 activities, with no districts offering more than eight types of activities. The number of types of Eisenhower-assisted activities differs significantly by both district poverty and district size. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of the number of types of activities supported by Eisenhower funds. The number to the right of the distribution is the mean.

The Structural Features of Reform Types of Activities

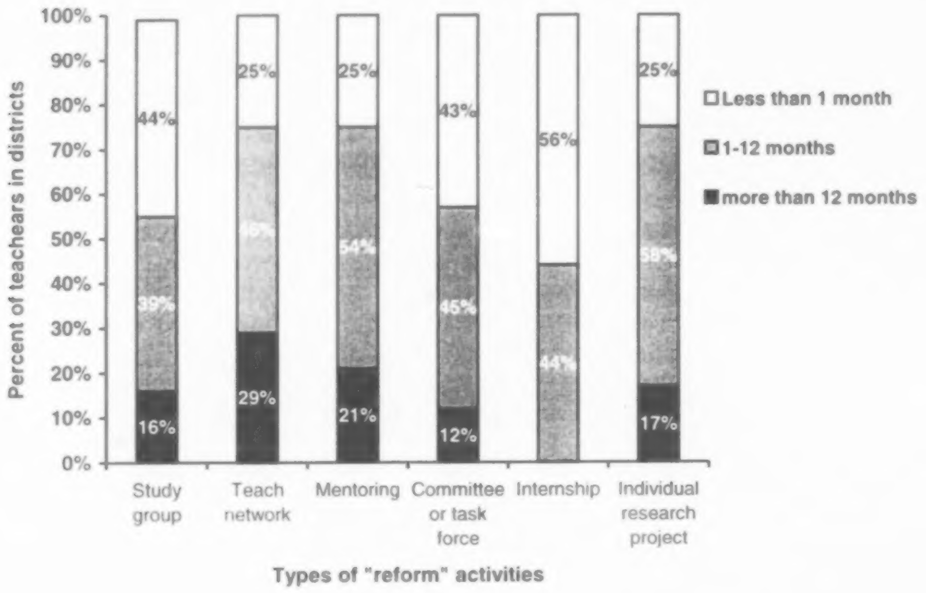
Even when districts support reform types of professional development activities, they may not have other features such as long duration that would foster better teacher outcomes. As we suggested earlier in this report, recent literature has described certain reform types of professional development as having features that enable teachers to reflect on their new knowledge, practice new skills, and engage in in-depth discussions of implementation issues. This implies that these reform types of professional development occur over a period of time that allows for such reflection, practice, and discussion.

Span. We did not ask coordinators the number of hours that teachers spent in reform activities, since for most of the activities a measure of hours did not seem easy for coordinators to know; for example, the literature suggests that participation in teacher networks often is ongoing. We did ask Eisenhower coordinators to report the time period over which each type of reform activity was typically spread; the choices were 1) one month or less, 2) more than one month but less than six months, 3) between six months and one year, or 4) more than one year. For the analysis, we combined the two middle categories. Exhibit 4.11a shows the percentage of districts reporting "typical" Eisenhower-assisted reform activities that lasted less than one month, one month to a year, and more than a year.

While reform activities typically extend over a relatively long period, this is not always the case. Exhibit 4.11a shows that Eisenhower coordinators report that nearly half (44 percent) of all teachers are in school districts where "typical" study groups last less than one month, and one quarter (25 percent) of teachers are in school districts where typical collaboratives or networks last less than one month. Such activities are generally described in the literature as ongoing, often regularly scheduled opportunities for teachers to meet to discuss students' learning and teacher practice (Lieberman & McLaughlin, 1992; Little, 1993). Therefore, it seems surprising that such a relatively high percentage of teachers are in districts that report that typical Eisenhower-assisted activities of these types last for less than a month. However, a majority of teachers are in districts that support reform activities that typically last for more than a month, with the exception of internships. In the case of teacher networks, over a quarter of teachers (29 percent) are in districts that typically offer this activity for longer than a year.

EXHIBIT 4.11a

Percent of Teachers in Districts by Span of Eisenhower-assisted Reform Activities (n varies by type)

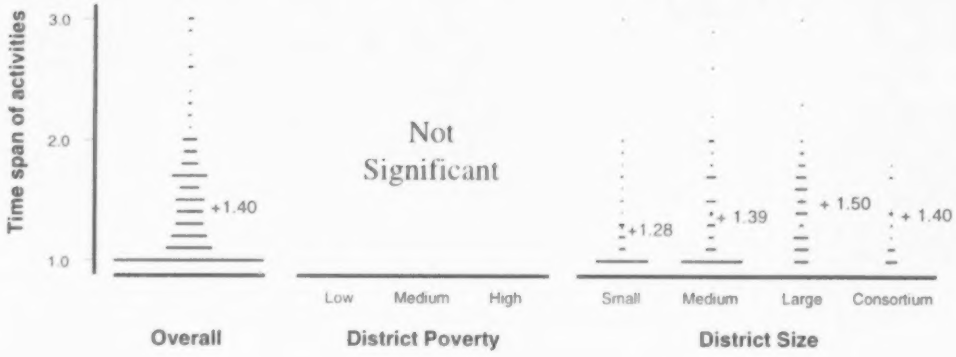


Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 44 percent of teachers are in districts that have study groups that typically last less than one month, 39 percent of teachers are in districts that have study groups that typically last between one and 12 months, and 16 percent of teachers are in districts that have study groups that typically last more than 12 months. Each bar shows the percent of teachers in districts that report having a particular activity for each of the three time span categories, illustrated in the key. The number at the top of each shaded area is the percent of teachers in districts for the corresponding time span category.

We created a composite variable of the span of all activities, both traditional and reform, where 1=less than one month, 2=one to 12 months, and 3=more than one year. As Exhibit 4.11b shows, professional development activities in large districts extend for a significantly longer span of time than activities in small districts. There are no statistically significant differences for district poverty level. These results support the notion that the greater capacity of larger districts may enable them to design and offer activities that span a greater length of time.

EXHIBIT 4.11b

Average Span of Eisenhower-assisted Activities, Overall and by District Poverty and District Size (n=353)



	Significant Pairwise Contrasts
Size	Small vs. Large

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, districts report that their Eisenhower-assisted activities have a span of 1.4 (i.e., between "less than one month" and "one month to a year"). The span of traditional and reform activities differs significantly by district size, but not by district poverty level. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of the number of types of activities supported by Eisenhower funds. The number to the right of the distribution is the mean.

Case-study Examples of District Support for Reform Types of Professional Development Activities

Survey data show that some districts use their Eisenhower funds predominantly for reform types of professional development activities, and our case-study data provide us with examples of districts. Boonetown, Kentucky, one of our in-depth case studies, is an example of a district in which the great majority of Eisenhower-assisted professional development supports reform types of professional development.

In Boonetown, Eisenhower funds support teacher mentoring and coaching, as well as other forms of activities where teachers share knowledge with their peers. Almost all Eisenhower funds in the district go toward building school capacity. The district does this by supporting four resource teachers who act as mentors to other teachers in the district. These resource teachers provide in-class modeling, assistance in preparing lessons, and observations of other teachers. In each school, the principal determines priorities for the resource teachers, based on the school goals that, in turn, reflect the performance of students on the statewide assessment. Even where funds are used to enhance the skills of individual teachers, they are expected to teach these skills to other teachers. The principals encourage teachers with strong leadership qualities and specific professional development interests to use Eisenhower funds to develop their expertise in an area (e.g., graphing calculators), then return to the school and train their peers. Teachers may use Eisenhower funds to attend conferences as well as workshops if they will share their knowledge with other teachers in their schools.

Comparing Eisenhower-assisted Activities to All District Professional Development Activities

So far we have been focusing on district portfolios of Eisenhower-assisted professional development activities. But Eisenhower-assisted professional development is only one part of a district's professional development program. Title II provides only a portion of a district's budget and incentives for professional development. Each district has its larger portfolio of professional development that includes both Eisenhower-assisted activities and non-Eisenhower funded activities. Most school districts offer teachers opportunities for professional development that they fund from state, local, or other federal sources. Our survey data allow us to further examine the whole pattern of district professional development activities, both those funded by Eisenhower and those funded by other sources.[10]

We asked district coordinators whether their districts offer each type of professional development activity, and if so, if they support the activity with funds from the Eisenhower program. As Exhibit 4.12 illustrates, over 80 percent of teachers work in districts that support in- and out-of-district workshops and use Eisenhower funds to do so. Less than 10 percent of teachers are in districts that support these workshops but do not use Eisenhower funds for them.

As illustrated in Exhibit 4.13, many districts offer reform types of professional development activities but do not use the Eisenhower funds to support them. For example, of those teachers in districts that support mentoring and committee or task force membership, about half are in districts that use Eisenhower funds to do so. That is, 30 percent of teachers are in districts that use Eisenhower resources to fund mentoring, and 31 percent of teachers are in districts that support mentoring, but not with Eisenhower funds. Similarly, 35 percent of teachers are in districts that fund committees or task forces with Eisenhower resources, and 35 percent of teachers are in districts that offer these activities, but do not use Eisenhower funds for them.

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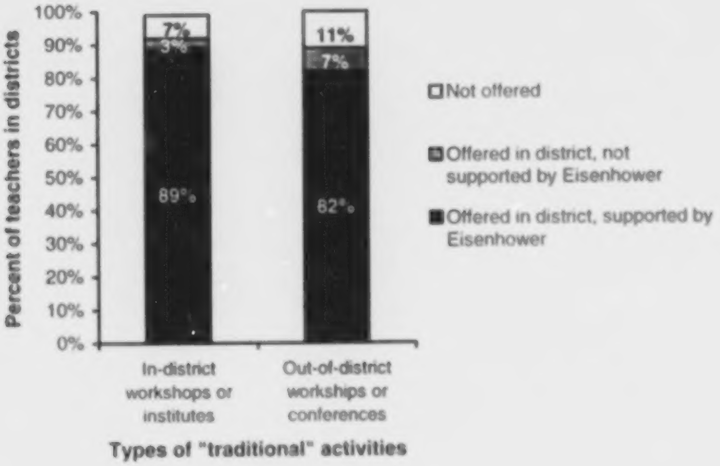
[10] We explored a number of analyses to identify clusters of districts that were similar in their portfolios of professional development, but for the most part we did not find any clear clusters; instead there appeared to be great variability among districts in the kinds of professional development that they provide. We were therefore unable to classify districts according to the types or characteristics of the professional development that they provide.

EXHIBIT 4.12

Percent of Teachers in Districts That Fund Workshops with Eisenhower Funds, Other Sources, or Not at All (n=353)



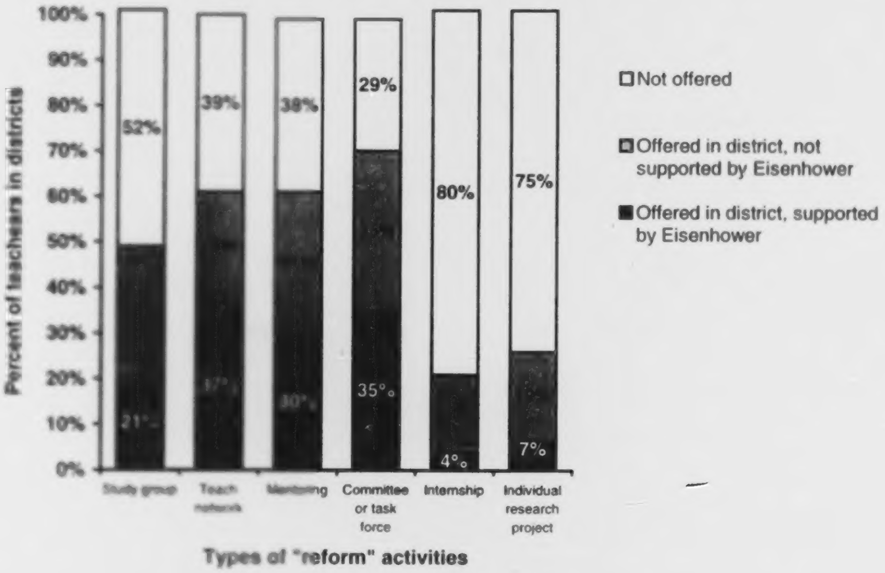
Source. Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 7 percent of teachers are in districts that do not offer in-district workshops and institutes, 3 percent of teachers are in districts that offer them but do not support them with funds from the Eisenhower program, and 89 percent of teachers are in districts that offer them and support them with Eisenhower funds. Each bar shows the percent of teachers in districts that report the status of a particular type of activity, for each of the three status categories illustrated in the key. The number at the top of each shaded area is percent of teachers in districts for the corresponding status category.

Eisenhower support for the remaining four reform activities varies. Districts that support teacher networks are more likely than not to use Eisenhower funds to do so; thirty-seven percent of teachers are in districts that fund teacher networks with Eisenhower dollars, and 24 percent are in districts that support networks, but do not use Eisenhower funds for them. In contrast, districts are less likely to use Eisenhower funds to support study groups, internships, and individual research projects. For example, 21 percent of teachers are in districts that use Eisenhower funds to support study groups, while 28 percent of teachers are in districts that support study groups without using Eisenhower funds. Very few districts use money from the Eisenhower program to support internships and research projects. Only four percent of teachers are in districts that use Eisenhower money to support internships, compared to 17 percent of teachers in districts that support this activity without using Eisenhower funds. The same pattern exists for individual research projects; only seven percent of teachers are in districts that support research projects with Eisenhower funds, while 19 percent of teacher are in districts that support them but do not use Eisenhower funds to do so.

Although Eisenhower funds may be used to provide support for all types of professional development, districts are much more likely to report using Eisenhower resources to fund traditional types of professional development—specifically in- and out-of-district workshops and institutes—than any other type of activity. Teacher networking is the only type of reform activity for which more than half of teachers in districts that offer the activity are in districts that use Eisenhower funds to support it.

EXHIBIT 4.13

Percent of Teachers in Districts That Fund Reform Types of Activities with Eisenhower Funds, Other Sources, or Not at All (n=353)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 52 percent of teachers are in districts that do not offer study groups; 28 percent of teachers are in districts that offer them but do not support them with Eisenhower funds; and 21 percent of teachers are in districts that offer them and support them with Eisenhower funds. Each bar shows the percent of teachers in districts that report the status of a particular activity, for each of the three categories illustrated in the key. The number at the top of each shaded area is percent of teachers in districts for the corresponding status category.

Given the goals of the Eisenhower program to support professional development that is sustained, intensive, and of high quality, and given our finding in Chapter 3 that reform types of professional development are associated with other structural and core features of high-quality, these findings may be cause for concern. They may indicate that many districts do not view Eisenhower funds as a resource for precisely the types of activities that the legislation is intended to support.[11]

It is unclear why districts may choose to use Eisenhower funds disproportionately for workshops rather than for other types of activities. Districts may choose to spend Eisenhower money on workshops for the same reason that workshops are popular generally—because this method allows districts to reach more teachers for less money than would be possible with most of the reform types of activities. Another possibility is that several of the reform activities, such as mentoring and internship/immersion activities, require resources that are greater than those available through the Eisenhower program. In such cases, districts may use other sources of funding for these extended, more expensive activities, and use Eisenhower funds for add-on programs and activities, such as

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[11] Our data do not provide information on the proportion of *within* district funds spent on traditional vs. reform activities.

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workshops and institutes, which are less typically less expensive. Further, systems may already be in place that channel Eisenhower funds to these traditional professional development activities before any other type of activities, and these systems may be difficult to alter.

Finally, districts may be unaware that they can use Eisenhower funds for some reform types of professional development. In response to questions about whether they used Eisenhower funds for reform types of professional development activities, some district coordinators in our national sample appeared surprised that they could use Eisenhower funds for these purposes.

Summary: Structural and Core Features of Traditional and Reform Activities

Findings from our National Profile of Eisenhower coordinators and from our case-study districts clearly indicate that districts differ substantially in the patterns of activities that they support with Eisenhower funds. Data from district Eisenhower coordinators indicate that most school districts use Eisenhower funds to support traditional types of professional development—that is, in-district workshops and institutes, and out-of-district workshops and conferences. According to district Eisenhower coordinators, these activities generally are eight hours or less, and span over less than a week. In most districts, the great majority of participations are in such traditional types of professional development activities. Further, district coordinators also report that the opportunity for active learning that they are least likely to offer is teachers being observed in their own classrooms, which may be one of the most important methods for changing teacher practice.

However, data from district coordinators indicate that districts vary tremendously in their reliance on traditional types of professional development activities and in the quality of these activities. While most districts have large proportions of participations in such activities, other districts do not. Some districts support workshops that have high-quality structural and core features—by involving greater amounts of learning time, more collective participation, and opportunities for active learning, for example—while workshops in other districts are less likely to have these features.

Similarly, while many districts use Eisenhower funds to support teachers' participation in reform types of professional development activities, teacher participation in these reform types is typically very low. This is even more true in small and low-poverty districts.

This pattern may be partially explained by the fact that several of these reform activities do not lend themselves to large numbers of participants, but rather are designed specifically for small numbers of participants, such as teacher committees. Districts also may not be able to afford support for some of the reform types of professional development for large numbers of their teachers. By their nature, some reform types of professional development may be more costly than traditional types of professional development, or may take more time than teachers have to commit. For example, if districts were to pay teachers for the time involved in formal mentoring relationships that extend over long periods of time, or for ongoing study groups, or for substitutes so that teachers could participate in such activities, they would certainly be more costly than traditional workshop arrangements.

District coordinators' reports about patterns of support for reform activities mirror the data from our teacher survey, reported in Chapter 3. While a notable number of school districts use

Eisenhower funds for reform types of professional development activities, most districts tend to support such activities for only a small proportion of their teachers.

These findings appear to indicate that there is room for districts to improve in meeting the intent of the 1994 reauthorization. However, in the absence of information about the use of Eisenhower funds for reform types of professional development activities prior to the 1994 reauthorization, we do not know for sure whether districts are moving in the direction of using Eisenhower funds for reform activities. The previous evaluation of the Eisenhower program did not ask a national sample of districts about their support of reform types of activities (Knapp et al. 1991). If such activities were supported very rarely in the past, then the proportions that we report could represent an increase in districts' reliance on reform types of professional development activities supported by Eisenhower funds.

Further, we found that not all of the traditional activities have characteristics of low-quality professional development, nor are all reform types of high quality. The literature on professional development suggests that traditional types of professional development generally provide less opportunity for reflection, practice, and discussion than do reform types of professional development (Little, 1993; Sparks & Loucks-Horsley, 1989). This means that, in general, traditional types of activities would be less likely than reform activities to foster the types of reflection, in-depth treatment of content, and opportunities for active learning that were envisioned in the 1994 reauthorization. While this may generally be true, as we demonstrated in Chapter 3, our data from district Eisenhower coordinators indicate that the duration of both types of activities varies substantially across districts. In some districts, traditional types of professional development meet for many hours, extend over a long period of time, include multiple learning strategies, and have opportunities for collective participation. And in some districts, reform types of professional development, such as networks or study groups, last only a few weeks. The range across districts in the duration of reform types of activities, and the fact that a substantial proportion of these activities are spread over less than one month, are surprising findings. They lead us to conclude that both traditional and reform types of professional development can have characteristics of high-quality professional development, and that reform types of professional development are not automatically of higher quality than professional development activities with a traditional format.

Our results indicate that although some districts provide "sustained and intensive" professional development, whether structured as a traditional or reform activity, most districts do not. Thus it seems that the legislative intent of the1994 reauthorization has not yet been realized, except in a minority of sites. Districts do not adequately use their Eisenhower funds to support professional development activities that have the features of high quality as identified in the literature on professional development and in the findings from our study of teachers in Chapter 3. Although districts provide activities of longer duration than in the early 1990s (see Knapp et al., 1991), our findings suggest that there is still a great deal of room for improvement. This leads us to the conclusion that federal efforts must continue to encourage districts to support sustained, intensive, and high-quality professional development activities with Eisenhower funds.

TARGETING AND RECRUITMENT OF TEACHERS

Section Findings

- *Districts report that they target professional development activities more to teachers in low- achievement, high-poverty, and Title I schools than to other groups of teachers. High-poverty districts and large districts target these groups of teachers significantly more than other districts.*
- *Almost all teachers come to participate in Eisenhower-assisted activities through volunteering or principal selection.*
- *Nearly all districts publicize their professional development activities, and most also try to increase participation by tailoring the focus of activities to specific groups of teachers and creating incentives for participation.*

So far, we have discussed differences in professional development opportunities among districts according to their emphasis on particular subject matter, their focus on traditional versus reform types of activities, and the structure and core experiences of these activities. Two other important factors that affect teachers' professional development opportunities are the extent to which districts target activities toward specific groups of teachers and their methods of recruiting teachers to participate in activities. In Chapter 3, we found that, despite the program's formula that targets more funding to higher poverty districts, and the legislative emphasis on serving teachers of special populations of children, such teachers were only somewhat more likely to participate in Eisenhower-assisted professional development than would be expected from their numbers in the population as a whole.

The Eisenhower legislation, like other federal, state, and local efforts, aims to improve the educational outcomes of all students, including those who historically have not had access to high-quality educational opportunities, or who have had greater difficulty succeeding in school. Several Title II provisions emphasize that activities for teachers funded by the Eisenhower program should benefit students from diverse backgrounds. The law states as one of its purposes the goal of "meeting the educational needs of diverse student populations," including economically disadvantaged students (Section 2002(2)(D)).

In addition, the local plan for professional development, required in the legislation, must describe how local professional development activities meet the needs of these students. The law contains a number of provisions that share a particular emphasis on activities that meet the needs of teachers who work in school with high rates of poverty and low achievement, and with diverse student populations.

In particular, local applications for Title II funds must include a description of how Title II activities will be designed to address the needs of teachers who are working in schools that receive assistance from the federal government under Part A of Title I (Section 2208(d)(1)(B)).

The rationale for these provisions is that teachers of special populations of students are more likely than other teachers to have little teaching experience; be working at schools with fewer resources; have larger classes; have behavior, safety, and other non-academic issues to confront; and have students who are more challenging to teach than more advantaged students (Darling-Hammond, 1997a; U.S. Department of Education, 1999a). Teachers of disadvantaged students often do not feel prepared to meet the needs of their students (U.S. Department of Education, 1999a). Thus, these are often the teachers who most need professional development (Corcoran, 1995; Darling-Hammond, 1997b). Although they may be more in need of professional development than others, teachers of students in schools with high rates of poverty, and low-achievement, or Title I schools, sometimes have less opportunity to participate in certain types of professional development than teachers of students in more advantaged schools (U.S. Department of Education, 1998a).

In this section of the chapter, we present data that demonstrate the extent to which districts address the legislative emphasis on targeting and recruiting specific groups of teachers to participate in Eisenhower-assisted professional development opportunities. First we show how districts choose different groups of teachers to target, then we present data about the different ways that teachers come to participate in Eisenhower professional development activities. Finally, we show how districts vary in the type and number of methods that they use to increase teacher participation in Eisenhower-assisted professional development opportunities.

Targeting Teachers of Special Populations of Students

The district can influence who participates in professional development activities in several ways. One way is by focusing professional development opportunities on a particular subject area. As we illustrated in the first section of this chapter, virtually all school districts target their Eisenhower-assisted activities on mathematics and science and, therefore, target teachers of these subjects.

Another way districts influence what type of teachers participate is by focusing district recruitment efforts on specific groups of teachers. To find out whether districts are targeting teachers of special needs and disadvantaged students as outlined in the legislation, we asked district Eisenhower coordinators to indicate whether they placed "no particular emphasis," "some emphasis," or a "strong emphasis" on recruiting the following types of teachers: 1) teachers from Title I schools, 2) special education teachers, 3) teachers of limited English proficiency students, 4) teachers from schools with low achievement levels, and 5) teachers from high-poverty schools (50 percent or more students eligible for free/reduced-price lunch).[12]

As Exhibit 4.14 illustrates, similar percentages of teachers are in districts that report placing some or a strong emphasis on recruiting teachers from Title I schools (58 percent), schools with low achievement (66 percent), and high-poverty schools (58 percent). Sixty percent of teachers are in districts where the Eisenhower coordinator reports placing some or a strong emphasis on recruiting special education teachers, and 47 percent of teachers are in districts that place an emphasis on recruiting teachers of students with limited English proficiency. Thus, a majority of district coordinators say that they are targeting their professional development programs to the particular groups of teachers emphasized in the legislation.

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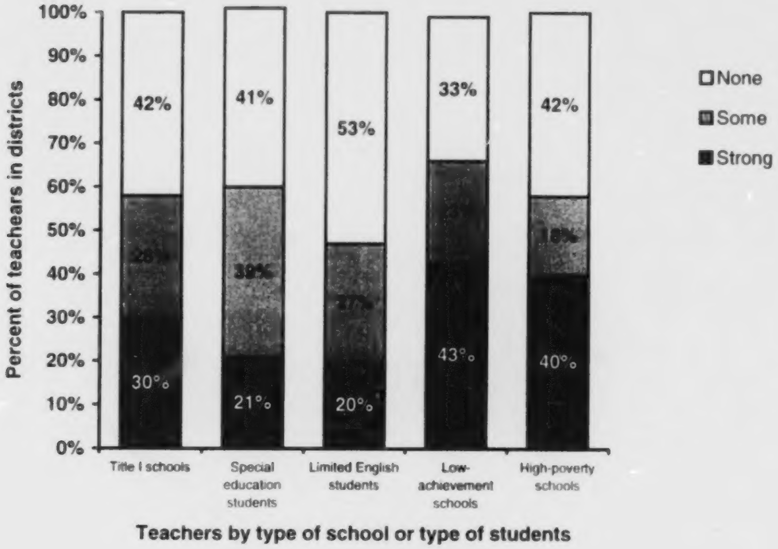
[12] A teacher can work at a high-poverty *school* whether or not he or she is in a high-poverty *district*. A district is categorized as high-poverty based on the percent of low-income students in the district; within a district, schools vary in the number of low-income students who attend them, and low-income students are often concentrated in particular schools within a district.

EXHIBIT 4.14

Percent of Teachers in Districts That Report Placing No, Some, or a Strong Emphasis on Recruiting Teachers of Special Student Populations (n=363)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 42 percent of teachers are in districts that place no emphasis on recruiting teachers in Title I schools, 28 percent of teachers are in districts that place some emphasis on recruiting these teachers, and 30 percent of teachers are in districts that place a strong emphasis on recruiting them. Each bar shows the percent of teachers in districts that report placing "none," "some," or a "strong" emphasis (as illustrated in the key) on recruiting teachers of special populations of students. The number at the top of each shaded area is percent of teachers in districts for the corresponding category of emphasis.

Further analysis of these data indicates that districts that emphasize recruiting teachers of one special population group (e.g., special education teachers) tend to emphasize recruiting teachers of other special populations as well. As Exhibit 4.15 illustrates, correlations of the emphasis given to recruiting different groups of teachers range from a moderate .53 to a high of .8. (A coefficient of one indicates perfect correlation.) In other words, some districts tend to emphasize recruiting multiple types of teachers; other districts do not tend to target at all.

We formed a scale to measure the extent of district targeting efforts by adding district responses to how much emphasis they placed on recruiting the different groups of teachers, where 1="no particular emphasis," 2="some emphasis," and 3="strong emphasis." As Exhibit 4.16 shows, the extent to which districts try to recruit various groups of teachers varies significantly by both district poverty and size. High-poverty districts are more likely to recruit teachers of special populations than either low- or medium-poverty districts. Similarly, large districts are more likely to recruit particular types of teachers than small- or medium-sized districts.

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EXHIBIT 4.15

Correlations Among the Emphasis on Recruitment of Teachers of Special Populations of Students (n=363)

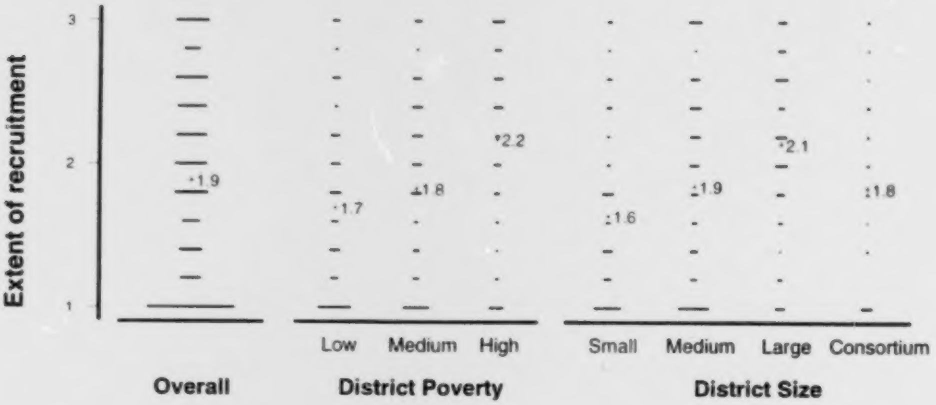
	Teachers from Title I	Special Education Teachers	Teachers of Limited English Students	Teachers from Low-Achievement Schools
Special Education Teachers	.65			
Teachers of Limited English Students	.56	.62		
Teachers from Low-Achievement Schools	.63	.60	.53	
Teachers from High-Poverty Schools	.70	.56	.60	.80

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first correlation shows that recruiting special education teachers and recruiting teachers from Title I schools are significantly correlated at .65 where one indicates a perfect correlation. Each coefficient indicates the magnitude of the correlation between the two variables it represents. All correlations are significant at the .05 level.
Note: The coefficients are Pearson correlation coefficients.

Districts' reports of an emphasis on recruiting teachers of diverse student populations, especially teachers from low-achievement or high-poverty schools, is curious in light of the findings of the previous chapter. In Chapter 3, we found that teachers from high-poverty schools, or schools with high proportions of minority students, are only somewhat more likely than other teachers to participate in Eisenhower-assisted professional development activities. This is the case despite the fact that the Eisenhower formula provides a greater amount of funding to districts with large proportions of poor children. Thus, while most teachers are in *districts* that report placing an emphasis on recruiting teachers of students from diverse populations, teachers in high-poverty *schools* are not much more likely than others to participate, according to our national survey of teachers. To explore this issue further, we now turn to a description by district coordinators of how teachers come to participate in Eisenhower-assisted activities.

EXHIBIT 4.16

Extent of Recruitment of Teachers of Special Populations of Students, Overall and by District Poverty and District Size (n=363)



	Significant Pairwise Contrasts
Poverty	Low vs. High, Medium vs. High
Size	Small vs. Large, Medium vs. Large

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, districts report that they place "some emphasis" (i.e., 1.9, where one=no emphasis, two=some emphasis, and three=strong emphasis) on recruiting teachers of various types of students. The extent of targeting differs significantly both by district poverty and district size. Each dot represents one district. As the number of participations at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the extent of emphasis that districts place on recruiting various types of teachers. The number to the right of the distribution is the mean.

How Teachers Come to Participate in Eisenhower-assisted Professional Development Activities

Teachers can come to participate in Eisenhower-assisted professional development activities in a number of ways. For instance, they can volunteer to participate, they can be selected to attend by their principals, they can take turns participating, or they can be selected to participate by the professional development provider. An evaluation of NSF's Statewide Systemic Initiatives noted that heavy reliance on teachers to volunteer for high-quality professional development activities is "at best only a part of a strategy for systemic reform of mathematics and science education" (Corcoran, Shields, & Zucker, 1998). One reason is that districts may not be able to shape the incentives and constraints that determine which teachers volunteer. Therefore districts that rely on other methods to increase teacher participation besides volunteering may be more likely to access teachers who otherwise would not participate. With this in mind, we asked district coordinators to indicate what percent of the teachers in Eisenhower-assisted activities come to participate in each of the following ways: 1) volunteering, 2) selection by their principal or other administrator, 3) selection by providers, 4) rotation, and 5) other ways.

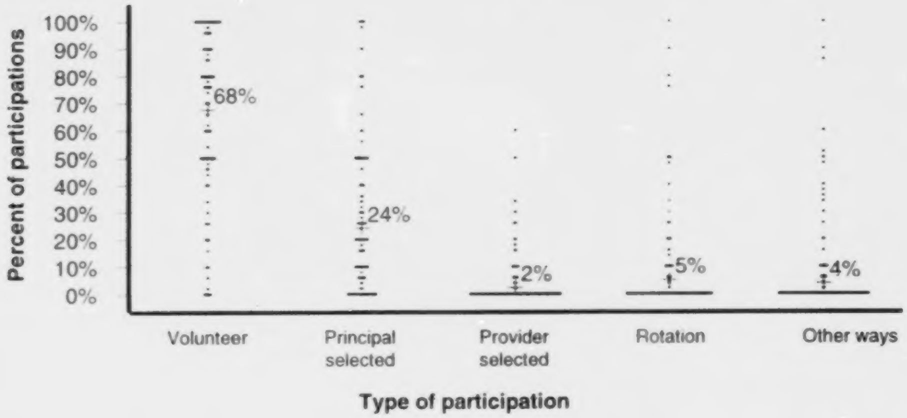
Exhibit 4.17 illustrates that the vast majority of teachers participate in Eisenhower-assisted professional development either by volunteering (68 percent) or by being selected by the principal

(24 percent). The exhibit also shows that districts vary tremendously in their use of these different methods of drawing teachers to participate in Eisenhower-assisted professional development opportunities. A good number of districts rely exclusively or nearly exclusively on volunteers. And though by and large districts do not rely heavily on rotation or selection by provider to attract teachers to participate, some districts use these methods extensively.

The heavy reliance by districts on volunteers may be one explanation of the fact that teachers of students with the greatest needs do not participate in Eisenhower-assisted activities in greater numbers, despite districts' reported emphasis on recruiting such teachers. Analyses (not shown) indicate that teachers in high-poverty schools are no more or less likely to volunteer for professional development than other teachers; thus, it may be more effective to use other strategies to increase the participation of teachers of high-need students. Designing activities for whole schools may be one way of addressing this problem, while also achieving the benefits of collective participation. However, a whole-school approach may not be effective in some cases; successful participation in professional development activities demands a certain level of commitment by teachers, and recruiting volunteers helps to ensure that teachers are willing to devote the time and effort required to benefit from the activity.

EXHIBIT 4.17

Percent of Participations in District Eisenhower-assisted Activities, By How Teachers Come to Participate (n=358[13])



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, districts report that 68 percent of teacher participations are volunteers. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution of districts for that particular category. The number to the right of the distribution is the mean.

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[13] Of our total sample of 363 district Eisenhower coordinators, five did not answer this survey question; therefore the sample size for this variable was 358.

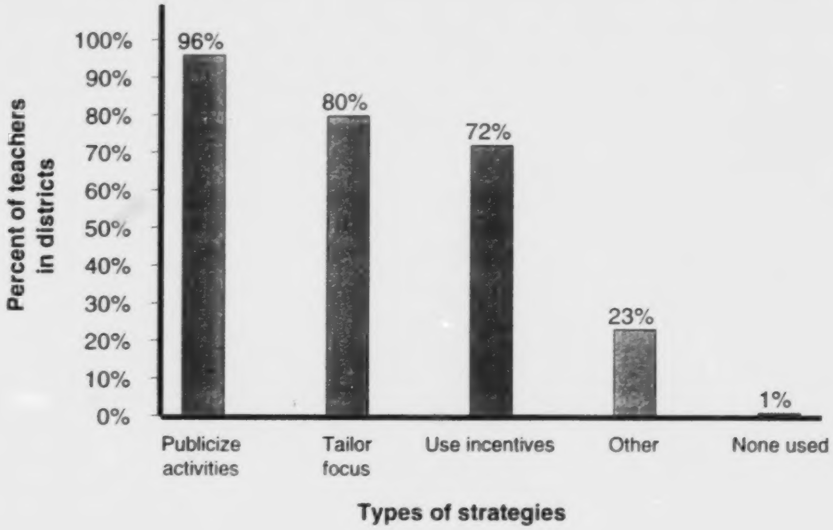
Methods of Increasing Teacher Participation

As part of targeting particular groups of teachers for participation in Eisenhower-assisted professional development activities, districts can take a number of steps to ensure that teachers have information about these activities. We asked district coordinators to indicate the ways in which they try to increase the participation of teachers, paraprofessionals, or other staff. District coordinators indicated whether they 1) publicize activities, 2) tailor the focus of professional development toward the needs of special populations, 3) use incentives, 4) use other strategies, or 5) use no special strategies. The question did not ask *how often* districts used these strategies, but only *whether* they used a particular strategy.

Exhibit 4.18 shows the percent of district Eisenhower coordinators who report undertaking different methods to increase participation in Eisenhower-assisted professional development activities.

EXHIBIT 4.18

Percent of Teachers in Districts That Use Various Strategies to Increase the Participation of Teachers in Eisenhower-assisted Activities (*n*=363)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 96 percent of teachers are in districts that try to increase teacher participation by publicizing their professional development activities. Each bar and the number on top of it represent the percent of teachers in districts for each category.

Most districts use several methods to increase teacher participation, but some methods are used more than others. Most teachers (96 percent) are in districts that publicize their professional development activities, 80 percent of teachers are in districts that tailor the focus of the activities to special populations, and 72 percent are in districts that use incentives to increase participation in professional development activities. The finding that 80 percent of teachers work in districts that report tailoring the focus of professional development activities toward the needs of special populations goes hand-in-hand with the findings reported earlier that a majority of teachers are in districts that report placing either some or a strong emphasis on including teachers in low-achievement, high-poverty, and Title I schools, and, to a lesser extent, special education teachers and teachers of LEP students. Nevertheless, neither developing a tailored focus, nor the other strategies designed to increase the participation of teachers, appear to be effective in fostering the actual participation of teachers in high-poverty or high-minority schools, as reported in Chapter 3.

Summary: Targeting and Recruitment of Teachers

Our data show that most teachers are in districts that report making an effort to target teachers of students in schools with particular risk factors, such as high poverty or low achievement. Further, most teachers work in districts that use several strategies for informing teachers about professional development opportunities. Despite these efforts, and despite greater funding to districts that have large numbers of high-poverty students, teachers of students in high poverty are only slightly more likely than others to participate in Eisenhower-assisted activities. These findings question the actual implementation and effectiveness of recruitment strategies. Although in our national survey, district coordinators reported extensive targeting, in our six exploratory case sites (see Birman, Reeve, & Sattler, 1998), Eisenhower coordinators followed the approach of making Eisenhower-assisted activities available to all teachers, without making special efforts to target teachers of at-risk children. Our in-depth cases also did not find explicit strategies to recruiting teachers from high-poverty schools, or teachers of other at-risk students. These apparently mixed findings suggest that more in-depth questioning of Eisenhower coordinators may reveal less implementation of targeting and recruiting strategies than might be represented by our telephone survey results.

Even if districts do engage in targeting practices, the practices do not seem to be very effective. One reason that teachers of high-need students appear not to participate as extensively as district targeting strategies might suggest, could be the heavy emphasis that districts place on teachers' volunteering for professional development activities, since districts may be restricted in their ability to influence which teachers volunteer. These teachers in high-poverty schools may feel less comfortable taking time away from their students to attend professional development activities, given the academic challenges that their students face, as well as the behavior, safety, and non-academic problems that they may confront.

It would be helpful to have supplemental data that provide a measure of the quality of districts' targeting and recruiting efforts, as well as data about what might encourage teachers to volunteer for professional development. Even without this information, our findings suggest that policymakers and program administrators should increase efforts to target teachers of at-risk students, and develop effective methods of accomplishing this important goal.

DIFFERENCES IN DISTRICT PORTFOLIOS OF EISENHOWER-ASSISTED ACTIVITIES BY DISTRICT POVERTY AND SIZE

Throughout this chapter, for key variables we have indicated where patterns of Eisenhower support for professional development differ significantly according to the district poverty level or the size of the district. As we noted previously, all of the analyses simultaneously control for size and poverty, so any significant effects are independent of one another. Taken together, these findings help us understand how district demographic factors affect districts' use of Eisenhower resources. This section discusses these findings.

The level of poverty in a district sometimes is significantly associated with particular patterns of support for Eisenhower activities. Our data from Eisenhower coordinators indicate that, compared to lower-poverty districts, higher-poverty districts' portfolios of Eisenhower-assisted activities:

- have more participations in reform activities and fewer participations in traditional activities;
- offer more types of Eisenhower-assisted activities, both traditional and reform; and
- place more emphasis on recruiting teachers of special populations of students.

The Eisenhower program's funding formula provides more funds to districts that serve poorer populations, and our findings suggest that having more funds available enables a district to support more types of activities. Further, districts with more funds may be more willing to use resources to try reform methods of professional development, which may explain why high-poverty districts have more teacher participations in reform types of activities. In addition, districts with more students from low-income families probably place greater emphasis on recruiting teachers of special populations because these districts are more likely than others to serve students from these populations. In addition, high-poverty districts have more funding from Title I and other federal programs, which also provide support and encouragement for professional development for teachers of special groups of students. So it seems that one of the intentions of the legislation, to provide support for professional development to teachers of children in high-poverty communities, is at least in part being met. But there is a great deal of room for improving districts' targeting of their professional development activities to meet the needs of teachers of special populations of students, and the participation of these teachers in Eisenhower-assisted professional development activities.

The analysis for district size shows that, compared to districts with fewer teachers, the portfolios of Eisenhower-assisted activities in districts with larger numbers of teachers:

- have fewer participations in traditional types of professional development (except in low-poverty districts);
- provide more opportunities for active learning in professional development activities;
- have activities designed with more opportunities for collective participation;

- offer activities that span a longer period of time;
- provide a larger number of different types of activities, both traditional and reform; and
- place more emphasis on recruiting teachers of special populations of students.

Larger districts may have fewer participations in traditional types of professional development activities than smaller districts because, although large districts virtually always offer traditional activities, they also are more likely to offer reform types of activities. Small districts, perhaps because they have fewer resources and therefore have to limit the number of activities that they offer, support fewer types of professional development than large districts. The result is that smaller districts have more participations (in percentage terms) in traditional activities than large districts. For the most part, the ratio of participations in reform to traditional activities increases as size increases. The exception to this pattern is low-poverty districts, which do not have much variation in participations between small and large districts. These findings suggest that large districts are able to offer more reform activities and less traditional activities because of economies of scale that enable them to offer the sometimes more expensive reform activities and because of infrastructure and organizational advantages. Large *low-poverty* districts may be less inclined to seek change and innovation because on average, their students perform better than students in other districts.

Districts with more teachers also have higher quality in-district workshops and institutes than districts with fewer teachers. The in-district Eisenhower-assisted workshops and institutes offered by larger districts provide more opportunities for active learning and are more likely to be designed to foster collective participation. In addition, larger districts place more emphasis on recruiting teachers of special populations of students than do smaller districts.

The observed positive effects of size may be due in large part to the fact that large districts often have more Eisenhower money to spend on professional development than do small districts. Although Eisenhower funds available on a *per-teacher* basis are comparable, a critical mass of funds available in larger districts may allow them to offer a wider range of types of professional development, and to offer activities that span over longer periods of time. Larger districts may also tend to have more resources of other sorts, such as nearby universities, that will allow them to tap into a wider range of professional development types. In addition, large districts also have a more comprehensive, efficient infrastructure for planning and delivering professional development. This may allow them more opportunities and resources to shape and organize their professional development activities to be more sustained and intensive, and to be responsive to the needs of whole schools or groups of teachers from a school, rather than just individual teachers. Consortia seem to operate primarily like large districts. They provide significantly more opportunities for active learning and more types of activities than do small districts. In addition, in many cases consortia provide the same higher levels of collective participation and participation in reform approaches to professional development that large districts do. Thus, it appears that consortia, with similar capacity and resource advantages, enjoy the same positive effects of size as do large districts.

SUMMARY AND CONCLUSIONS

In this chapter, we examined how district portfolios of Eisenhower-assisted activities vary according to subject area focus, quality—as measured by the structural and core features of the activities, strategies for targeting and recruiting teachers for participation, and how these differences are accounted for by district poverty and district size. We identified a number of patterns that have implications for the Eisenhower program.

First, we found that nearly all districts use Eisenhower funds to support professional development in mathematics and science. These funds appear to have played an important role in supporting content knowledge in these subject areas in some districts, and fostering content knowledge is critical for teaching and learning. Continuing the subject area focus of Eisenhower-assisted professional development activities would allow the program to continue its important contribution in this area of professional development.

Second, we found that nearly all districts use Eisenhower funds to support traditional approaches to professional development activities that are not "sustained" or "intensive," as intended by the Eisenhower legislation. Even among districts that support reform types of professional development activities generally, many do not use Eisenhower funds to do so. Nevertheless, the fact that some districts manage to use Eisenhower funds almost exclusively for professional development activities that have features of high quality indicates that the program could perhaps do more to increase the number of districts using their Eisenhower funds in optimal ways. Along these lines, our findings suggest that since *either* reform or traditional activities can offer characteristics of high-quality professional development, it is more important for districts to focus on improvements in the structure and substance of the activities, rather than the particular type of activity.

Third, despite an emphasis on recruiting teachers from high-poverty schools, and other teachers of at-risk students, such teachers appear to participate in Eisenhower-assisted activities in numbers only somewhat greater than their proportions in the population. If targeting of professional development activities is an important goal of the Eisenhower program, districts may wish to rely less on teachers volunteering as the primary way teachers come to participate in Eisenhower-assisted activities. One alternative that could increase the impact of professional development is targeting certain schools and requiring all teachers to participate in the same professional development activity, although this may not be possible in some districts.

Finally, our data indicate that high-poverty districts, and large districts and consortia, often are more able and willing to support a diverse and extensive set of Eisenhower-funded activities than other districts. A greater amount of funding goes to such districts, but this alone does not fully explain the results. Perhaps larger districts have greater capacity, and higher poverty large districts see the greater need to provide new and more ambitious forms of professional development.

Thus, this chapter has identified areas in which districts need to focus in order to bring Eisenhower-assisted activities more in line with the intent of the legislation. But the Eisenhower legislation already contains provisions that intend to move districts toward higher quality professional development activities. By requiring that districts align Eisenhower-assisted professional development activities with state and district standards, coordinate these activities with those funded by other federal programs, and plan and evaluate professional development activities, the legislation intends to foster high-quality professional development.

In the next chapter we examine these aspects of the district-level management and implementation of Eisenhower-assisted professional development activities. We examine how school districts align, coordinate, plan, and evaluate their activities, and how district context (i.e., size and poverty) is associated with these district operations. In addition, we present a model of how district management and implementation is associated with features of its "portfolio" of Eisenhower-assisted professional development activities, including structural and core features that are associated with improvements in teacher knowledge and skills and changes in teacher practice. The goal of the next chapter is to identify and describe key factors in how districts manage and implement the program, and relate these to the district's use of Eisenhower funds to support high-quality professional development.

CHAPTER 5

DISTRICT MANAGEMENT OF EISENHOWER-ASSISTED PROFESSIONAL DEVELOPMENT ACTIVITIES

This chapter explores how districts manage and operate Eisenhower-assisted professional development activities. It also examines how key management, planning and implementation provisions of the Eisenhower legislation are associated with the quality of professional development activities, as defined by their structural and core features. The previous chapter described the tremendous variation across districts in their portfolios of Eisenhower-assisted activities—especially in their emphasis on traditional vs. reform methods of professional development, the duration of their activities, and the extent of collective participation and active learning opportunities of these activities. We also examined how districts select and target teachers to participate in Eisenhower-assisted activities. These features of district portfolios of Eisenhower-assisted activities are, in part, the cumulative result of districts' operation of Eisenhower-assisted activities.

The Elementary and Secondary Education Act (ESEA), as amended by the Improving America's Schools Act (IASA) of 1994, contains a number of provisions about how districts *should* manage and operate Eisenhower-assisted professional development activities. First, several provisions of the law stipulate that Eisenhower funds should be an integral part of state and district strategies to transform education. The ESEA states that districts must use their Eisenhower funds to support professional development activities that are aligned with challenging state and local content and performance standards. Furthermore, the ESEA requires that district Eisenhower-assisted activities be coordinated with other sources of funding for professional development activities, as appropriate.

Second, a group of provisions in the legislation sets forth procedures that districts are to follow in order to achieve its ultimate goals of improved teacher practice and student performance. The ESEA incorporates the federal government's emphasis on program performance and results. These procedures are grounded in a "continuous improvement" paradigm that has permeated all federal programs in recent years, spurred by the Government Performance and Results Act of 1993 (GPRA). GPRA requires a process of strategic planning for federal agencies that includes developing goals and measurable objectives, describing how they would be achieved, and using evaluation data to track progress toward these objectives. Similarly, the ESEA requires that states and districts assess their progress in meeting Title II performance indicators.

A third set of requirements in the legislation focuses on planning Eisenhower-assisted professional development activities. Districts are required to work with teachers and other school-level staff in planning professional development activities. The law especially emphasizes involving staff in Title I schools in planning Eisenhower-assisted activities.

The common underpinning of all of these legislative provisions is the assumption that they will improve the quality of professional development offered by school districts. By including requirements about the operation of district programs, the legislation attempts to specify practices that presumably will contribute to high-quality professional development.

In giving districts a prominent role in operating and managing Eisenhower-assisted activities, the legislation is consistent with recent literature on school reform, which also emphasizes the critical role of school districts in setting the context for professional development activities (Elmore, 1996; Knapp et al., 1991; Spillane, 1996; Spillane & Jennings, 1997). However, very little is known about how districts plan or operate professional development activities, or about which district strategies for fostering high-quality professional development activities are effective. Much of the professional development literature focuses on the optimal characteristics of individual professional development activities, and not on district strategies for professional development.

Recent research focuses on the importance of school-based professional development that is embedded in the daily life of teachers (Corcoran, 1995; U.S. Department of Education, 1999a; Little, 1982; Loucks-Horsley et al., 1998). Yet, even when professional development occurs at the school, districts can play a central role in its planning and implementation. They also play a role in building a vision of school reform and shaping professional development to support reform efforts (Elmore & Burney, 1996). Districts, for example, may play a key role in conveying to administrators, teachers, and providers of professional development the implications of state and local standards and assessments for professional development activities, and how various sources of funding could be used to support these activities. Districts also may play a role in providing technical support to schools in tracking progress toward achieving professional development goals. Certainly districts can guide the use of Eisenhower funds toward school-based programs that are coherent (i.e., consistent with teachers' goals, aligned with state standards and assessments, and encouraging of continuing professional communication among teachers), a key attribute of quality identified in Chapter 3.

In the present chapter, we take a more in-depth look at the district's role in shaping Eisenhower-assisted professional development activities. Specifically, we examine how districts address the alignment and coordination of the Eisenhower Professional Development Program with other programs; how districts implement "continuous improvement" based on indicators, needs assessments, evaluation, and guidance to schools and providers of professional development; and how districts involve teachers and other school staff in planning professional development efforts. Finally, we examine how all of these efforts are associated with the quality of Eisenhower-assisted professional development in the district. Exhibit 5.0 illustrates this chapter's focus on these key aspects of the districts' operation of Eisenhower-activities in the context of the entire study.

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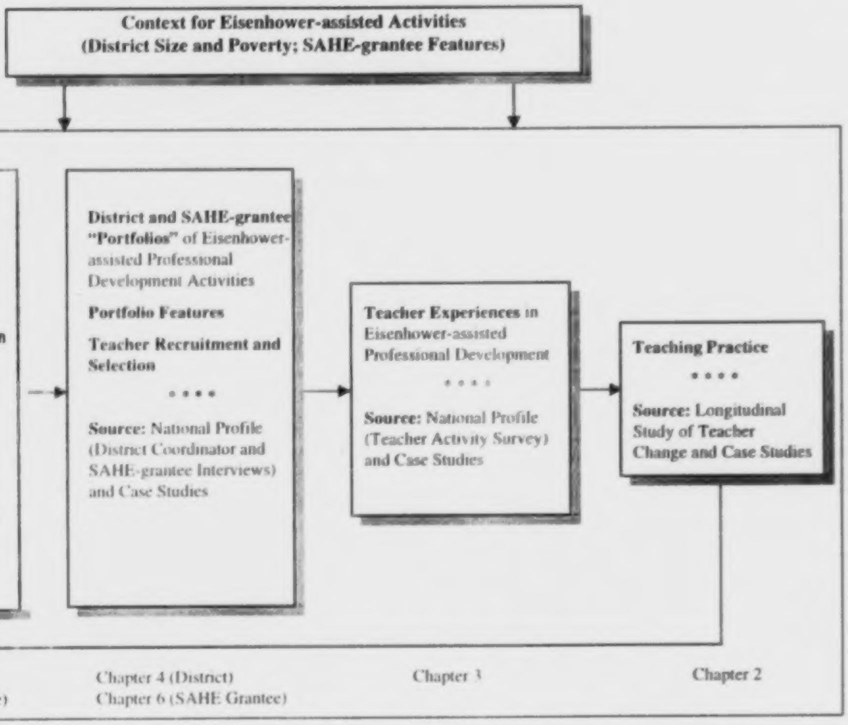
EXHIBIT 5.0

Conceptual Framework for This Evaluation


Context for Eisenhower-assisted Activities
(District Size and Poverty; SAHE-grantee Features)
District and SAHE-grantee Management of Eisenhower-assisted Activities
Building a Vision: Alignment and Coordination
Implementation: Continuous Improvement and Planning
• • • •
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
District and SAHE-grantee "Portfolios" of Eisenhower-assisted Professional Development Activities
Portfolio Features
Teacher Recruitment and Selection
• • • •
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
Teacher Experiences in Eisenhower-assisted Professional Development
• • • •
Source: National Profile (Teacher Activity Survey) and Case Studies
Teaching Practice
• • • •
Source: Longitudinal Study of Teacher Change and Case Studies
Chapter 5 (District)
Chapter 6 (SAHE Grantee)
Chapter 4 (District)
Chapter 6 (SAHE Grantee)
Chapter 3
Chapter 2

Data Sources

The results presented in this chapter are based on data from our national survey of district Eisenhower coordinators as well as data from case studies of districts across the country. We conducted telephone interviews in the spring of 1998 with a national random sample of district Eisenhower coordinators. Through a process of stratified random sampling, selected to allow variation on size and poverty level, we targeted a total of 400 districts across the country. We obtained survey data from a sample of 363 district Eisenhower coordinators, yielding a response rate of 88 percent. During the telephone interviews, coordinators reported on specific professional development activities that occurred from July 1997 through December 1997; questions about general practices applied to the 1997-1998 school year. The probability of a district being chosen for our sample was proportional to district size (i.e., the number of teachers in the district). As a result, all of the data are weighted by district size. Therefore, our findings provide information according to the percent of teachers in a district.

Our case study information is drawn from two sources. One source is a series of 10 in-depth case studies that we conducted during the 1997-1998 school year. The 10 case study districts are a purposefully drawn sample of districts, two from each of five states. We selected sites to obtain variation on state-level reform efforts and the districts' approach to professional development, as well as demographic and geographic characteristics. We also draw on six exploratory case study districts that we visited at the end of the 1996-1997 school year; we selected these districts primarily

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for diversity of region, urbanicity, and ethnic composition. Appendix A contains detailed information about our methodology for sampling the National Profile, and Appendix B contains detailed information about our methodology for selecting case studies.[1,2]

Organization of Chapter

This chapter is organized in six sections. The first three sections are organized according to the three main areas around which district roles revolve: 1) building a vision for education reform by aligning professional development with standards and assessments and coordinating with other programs; 2) implementing the vision for professional development through continuous improvement based on the use of objective data (through use of indicators, needs assessments and evaluations of Eisenhower-assisted activities), and the provision of guidance to schools and professional development providers; and 3) involving teachers in planning for professional development.

Throughout these three sections, for key management and implementation variables, we analyze and report whether there are statistically significant differences according to district poverty level or the number of teachers in the district (i.e., district size). For these analyses, poverty is divided into three levels—low (less than 10.9 percent of children in poverty), medium (10.9 to 21.4 percent of children in poverty) and high (greater than 21.4 percent of children in poverty).[3] District size is divided into four types—small (less than 250 teachers), medium (between 250 and 1500 teachers), large (more than 1500 teachers), and consortia. A consortium is a group of districts, which can range in size from only a couple of districts to several hundred districts. To identify consortia, we asked each district that we sampled whether or not the district participated in the Eisenhower Professional Development Program through a consortium. If the district did participate through a consortium, we then drew the entire consortium into our sample, and adjusted the probability of each of the consortia being selected into the sample, based on the full set of districts that belonged to the consortium.

The size and poverty effects are each estimated where the other is held constant, so significant results for one dimension are independent of the other dimension. Interaction effects between size and poverty are not statistically significant unless otherwise noted. The fourth section of this chapter provides a summary and discussion of how districts vary in alignment, coordination, continuous improvement, and planning according to the district's poverty level and size.

The fifth section of the chapter presents a model, based on our national data from district Eisenhower coordinators, of how district management and implementation practices influence the structural and core features of Eisenhower-assisted professional development activities. The sixth

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[1] The Study of Educational Resources and Federal Funding (SERFF) collected data on co-funding of Eisenhower activities and several other issues concerning the resources used for professional development in school districts. (See Chambers, Lieberman, Parrish, Kaleba, Van Campen, and Stullich, 1999.) In general, SERFF results are consistent with those reported here. Differences in results and those reported in the SERFF are primarily due to cross-study differences in data-weighting procedures, the wording of the items, or the presentation of conditional vs. unconditional results. (For example, the data on co-funding of Eisenhower-assisted activities from this evaluation of the Eisenhower program is based on districts where the program operates, while the SERFF results are based on all districts.) When these differences are taken into account, the results of the two studies are quite consistent.

[2] Results for some analyses reported in this chapter were reported earlier in U.S. Department of Education (1999b). The earlier results differ from results in this report because they were preliminary, unweighted, and did not include the full sample of teachers and districts. Results are considered to be statistically significant if the p-value is .05 or smaller.

[3] These categories divide the population equally into thirds.

and final section summarizes our major findings and discusses implications for both federal and district policy.

BUILDING A VISION FOR PROFESSIONAL DEVELOPMENT: ALIGNMENT WITH STANDARDS AND ASSESSMENTS, AND COORDINATION WITH OTHER PROGRAMS

Section Findings

- *Most of the nation's teachers are in districts where Eisenhower coordinators report substantial alignment of Eisenhower-assisted activities with state and district standards, and to a lesser extent, with state and district assessments.*

- *Many of the nation's teachers are in districts where coordinators report that other district staff, in addition to the Eisenhower coordinator, are involved in planning Eisenhower-assisted activities, and that district Eisenhower coordinators work together with other district-level program administrators, especially mathematics and science curriculum specialists.*

- *There is more coordination of the Eisenhower program with other mathematics and science-oriented initiatives, in comparison with initiatives that do not focus on these subjects. In districts where other federal programs operate, most teachers are in districts where Eisenhower coordinators report working with administrators of other federal education programs, especially those funded by NSF. Eisenhower coordinators to a lesser extent report working with administrators of ED-funded programs, such as Title I, Part A.*

- *Across all programs, districts are substantially less likely to report co-funding activities than working with other staff; co-funding of activities is more common with NSF-funded activities than with those funded by ED programs. However, we have no national data regarding the actual proportion of Eisenhower-assisted activities or participations that are co-funded with other programs.*

- *There is more coordination in larger and, to some extent, higher-poverty districts, than in other districts.*

The Eisenhower program predates recent moves toward systemic education reform, and it operates as just one of a number of funding streams for professional development in the nation's school districts. In some, generally small districts, Eisenhower funds may exist alongside a few other education programs, such as Title I, Part A; in other, usually large districts, it is one of a panoply of federal, state, and local programs, reform efforts, and professional development initiatives. The provisions of the Eisenhower legislation give prominence to the district's role in integrating Eisenhower-assisted professional development activities into other state and district education reform efforts through alignment with challenging education standards, and coordination with other education programs.

The Title II legislation reflects the importance of aligning professional development with challenging state and local standards. Specifically, the legislation stipulates that the LEA's plan shall "be aligned with the State's challenging State content standards and challenging State student performance standards" (Section 2208 (d)(1)(C)) and "describe a strategy, tied to challenging State content standards and challenging State student performance standards, consistent with the needs assessment under subsection (b)" (Section 2208 (d)(1)(D)). Title I of ESEA requires that by the 1997-98 school year, each state was to have adopted challenging content standards, in at least reading and mathematics, and challenging performance standards that describe students' mastery of the content standards. Forty-eight states, plus Puerto Rico and the District of Columbia, have met federal requirements for developing challenging statewide content standards. Twenty-one states, plus Puerto Rico, have met the requirement for developing student performance standards (U.S. Department of Education, 1999b).

Aligning professional development with standards and assessments can be one way that districts work to send a common message to teachers about appropriate instruction (Webb, 1998). Lessons from systemic reform indicate that fragmentation within the system decreases motivation for working on reform (Fullan, 1993, 1996), and that success is in part contingent upon establishing long-term goals and being able to articulate a new vision (Cohen & Spillane, 1992). When policies and reforms are unaligned, teachers notice the inconsistency (Grant, Peterson, & Shojgreen-Downer, 1996); alternatively, when policies and reforms are aligned, this can work to encourage changes in instruction (Spillane & Jennings, 1997).

In the literature, there is little evidence that districts generally provide a common vision that would guide the use of professional development funds from a variety of sources, or link professional development to other education reform efforts. In addition, research indicates that districts generally are unaccustomed to planning portfolios of professional development activities strategically to achieve instructional goals or other types of goals and objectives (Elmore, 1993). Furthermore, professional development generally does not appear to be embedded in the daily activities of schools and teachers. Rather, "most school systems see professional development as a discrete activity… or service that is provided to schools as one of a number of centrally organized administrative functions" (Elmore & Burney, 1996, p. 23).

The consequence typically is a menu of discrete professional development activities, usually focused on specific content areas or pressing issues in the daily conduct of schooling, such as school discipline. As a result, activities are often organized and delivered centrally so that school personnel participate in training that is designed and conducted in isolation from their work setting (Elmore & Burney, 1996).

In their seminal case study of professional development in New York City's Community School District 2, Elmore and Burney (1996) emphasize the critical importance of establishing a focus for guiding professional development activities in the district. They describe a district that systematically identified instructional goals and objectives and designed a strategy for professional development to address directly these goals and objectives. The district's emphasis on instructional improvement focused its professional development activities. They view this district as an "existence proof" that districts can "be agents of serious instructional improvement," and that districts can use professional development as a tool for the reform of schools. Other researchers also have emphasized the importance of establishing a district vision for professional development (Spillane, 1996) and the important role of standards and assessments in shaping professional development activities (Cohen & Hill, 1998).

Besides alignment, another way for districts to focus professional development activities is by coordinating multiple sources of funding for professional development activities. The ESEA supports the idea of coordinating funding streams. The legislation indicates that Eisenhower funds should not be spent in isolation from other program funds, but instead Eisenhower-assisted activities should be planned and coordinated with other sources of funding for professional development. In addition, the law requires that state and local plans describe how Eisenhower-assisted activities are coordinated with other Education Department (ED) programs (such as Title I, Part A of ESEA and the Individuals with Disabilities Education Act (IDEA)), as well as with professional development efforts supported with funds they receive from other federal agencies (such as the National Science Foundation) (Section 2205(c) and Section 2208(d)(1)(H)).

Districts often must balance many sources of funding for professional development. When districts have established a focus for their professional development, they may deploy these multiple sources of funding toward the same ends. Leveraging resources can have a role in affecting the quality of professional development (Corcoran, 1995). For example, Elmore and Burney (1996) describe the "multi-pocket budgeting" that occurred in District 2, where the district administration used funding from multiple sources to fund its coherent professional development strategy.

In this section of the chapter, we use our district coordinator survey data to examine the extent to which districts integrate Eisenhower-assisted activities with other education reform efforts, which we measure by the districts' reported degree of alignment and coordination. We first describe the extent to which the district coordinators report linking professional development activities to state and district standards and assessments. We then examine the level of coordination between Eisenhower-funded activities and other programs. Coordination is measured by the extent of collaboration with others in professional development roles and with other federal programs, and by the extent to which districts use funding streams in a strategic way by combining funding sources. Taken together, these aspects of alignment and coordination can be thought of as an indication of the extent to which the district is providing a coherent vision for professional development.

Alignment of Eisenhower-assisted Activities with State and District Standards and Assessments

"Alignment" is a difficult concept to define and measure. Ideally, all aspects of an educational system are aligned with each other to support student learning to high standards. This might mean that textbooks, other materials, and instructional approaches that teachers use match state and local standards and assessments, that the professional development teachers receive helps them to use those materials and approaches appropriately, and that only what is valued is included in the curriculum or in assessments.

Evidence of alignment can be sought in many places. Webb (1998) notes that one could look for alignment in the consistency of content focus between professional development activities and standards and assessments; the extent to which professional development activities and standards and assessments are rooted in a common view of how students learn; and the extent to which professional development and standards and assessments reflect the view that all students must learn to high standards, which indicates attention to the learning needs of diverse students.

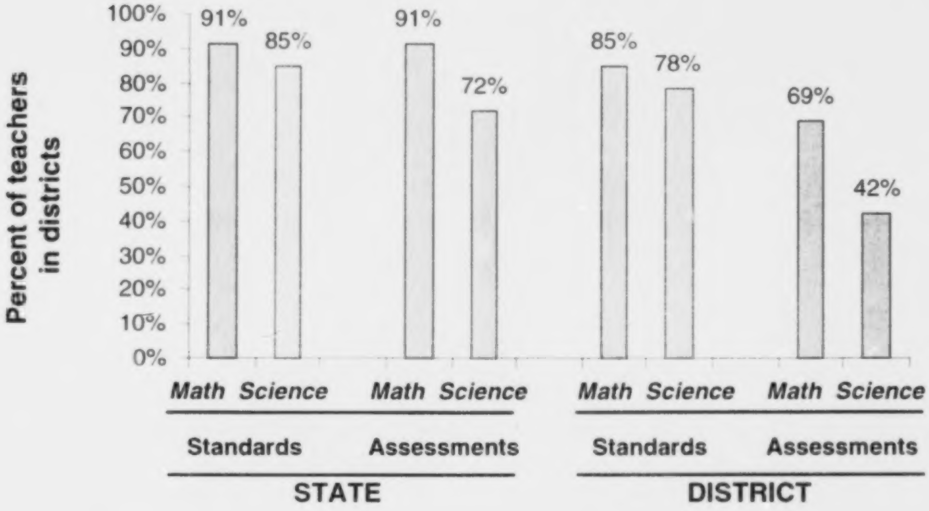
To measure how well districts are doing in meeting the legislative requirements in this area, we asked district Eisenhower coordinators participating in our national survey about the existence of state and local standards and assessments in mathematics and science, and the extent to which

Eisenhower-assisted activities are intended to support those standards and assessments. Specifically, we asked district Eisenhower coordinators whether statewide or district-wide standards or curriculum frameworks, or assessments, in mathematics or science, have been adopted. We then asked them to what extent the Eisenhower-assisted activities in their district were designed to help teachers adapt their teaching to meet the particular standards or assessments. Response categories were: 1) the activities are not at all designed to help teachers adapt their teaching to these standards or assessments, 2) the activities are designed to some extent to do this, or 3) the activities are designed to a large extent to do this.

As Exhibit 5.1a shows, Eisenhower coordinators indicate that their states typically have standards and assessments in mathematics and science. Ninety-one percent of teachers are in states with mathematics standards, and 85 percent of teachers are in states with science standards, according to district Eisenhower coordinators.

EXHIBIT 5.1a

Percent of Teachers in Districts Where State and District Mathematics and Science Standards and Assessments Exist (n= 363)



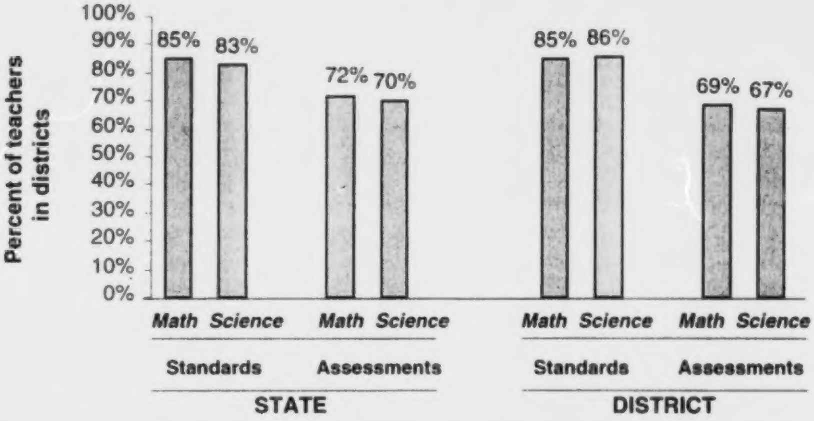
Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 91 percent of teachers are in districts that have state mathematics standards. Each bar and the number on top of it represent the percent of teachers in districts for each category.

In addition, Exhibit 5.1a shows that most Eisenhower coordinators also report the existence of state assessments, though slightly less frequently for science; 91 percent of teachers are in districts that report having state-level mathematics assessments, while only 72 percent of teachers are in districts that say they have statewide science assessments. Districts have their own mathematics and science standards somewhat less frequently than states in which they are located. Eighty-five percent of teachers are in districts that report that they have district standards in mathematics, and 78 percent are in districts that have district science standards. Further, districts are considerably less likely to have local-level assessments, particularly in science; 69 percent of teachers are in districts that have district assessments in mathematics, and 42 percent of teachers are in districts that have district assessments in science.

Exhibit 5.1b shows that, of the districts that report that they have state and/or district standards, 83 to 86 percent of teachers are in districts that say that Eisenhower-assisted activities in mathematics and science are designed to support these standards "to a large extent." Fewer coordinators report such support for assessments; only 67 to 72 percent of teachers are in districts where Eisenhower activities in mathematics and science support state and local assessments "to a large extent." However, the vast majority of teachers (94 percent or more) are in districts where Eisenhower-assisted activities support state and local assessments either "to some extent" or "to a large extent" (data not shown).

EXHIBIT 5.1b

Percent of Teachers in Districts Where Eisenhower-assisted Activities Are Aligned "to a Large Extent" with State and/or District Standards and/or Assessments (Where Such Standards and Assessments Exist) (n varies)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that of the teachers in districts with state mathematics standards, 85 percent of teachers are in districts reporting that their Eisenhower-assisted professional development activities are designed "to a large extent" to help teachers adapt to the state mathematics standards. Each bar and the number on top of it represent the percent of teachers in districts for each category.

There are a number of reasons that Eisenhower activities may be less aligned with assessments than with standards. First, the assessments themselves may not yet be appropriately aligned to the standards. This may be true, in part, because the ESEA requirement for assessments to be aligned with standards had not yet gone into effect at the time that we collected our data.[4] Furthermore, developing assessments, especially those that are aligned with high standards, has proven to be harder than developing the standards themselves.

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[4] While Title I of ESEA required that each state adopt challenging content and performance standards in at least reading/language arts and mathematics by the 1997-98 school year, final assessment systems are not required to be in place until 2000-2001 (U.S. Department of Education, 1999c).

Our data also show that where district standards exist, Eisenhower activities are as likely to be aligned with than as with state standards; similarly, where district assessments exist, Eisenhower-assisted professional development activities are equally likely to be aligned with state and district assessments. This is probably because states generally have more responsibility than districts for establishing and implementing standards; in addition, district standards often mirror state standards.

To determine whether the degree of alignment between Eisenhower-assisted professional development activities and standards and assessments differs according to district poverty or district size,[5] we developed a composite measure of alignment. It is a standardized scale, for which five indicates that district coordinators report professional development activities to be aligned "to a large extent" with both state and district standards and assessments, and zero indicates that district coordinators report not being aligned with standards or assessments at either level. The value of the scale for each district is based on the degree to which the district reports being aligned with whatever state and district standards and assessments exist in the district. As Exhibit 5.1c indicates, Eisenhower-assisted activities in large districts are significantly more likely to be aligned with state and district standards and assessments than Eisenhower-assisted activities in small districts. This may be because large districts have a more developed and sophisticated method for integrating state and district reforms with professional development activities. Previous research has shown that administrators often believe that they need more information on how to link professional development with standards (Celebuski & Farris, 1998), and this lack of information may be more prevalent in small than large districts. It also may be that districts with more teachers have more of a need to create an organized strategy for the design of their professional development activities, and thus are more likely than smaller districts to use state and district standards and assessments for this purpose. Poverty-level differences in alignment are not significant.

Case studies help to explain just how important state and local standards and assessments can be in shaping Eisenhower-assisted professional development activities. For example, in our two case districts in Texas, Eisenhower coordinators and other district administrators frequently referred to the Texas Assessment of Academic Skills (TAAS), the statewide assessment, as a critical determinant of the content of professional development. Indeed, in one of the two districts, administrators told us that everything they do is guided by TAAS. They report that professional development activities are geared to areas of the TAAS on which the district has identified a need for improvement. To a lesser extent, district administrators indicate that the Texas Essential Knowledge and Skills (TEKS), the state's new content standards, also are an important determinant of professional development. Texas illustrates that while, on average, standards are more influential than assessments, this is not always the case. In Texas, state assessment results are used for important accountability purposes, and this probably explains their greater-than-average influence.

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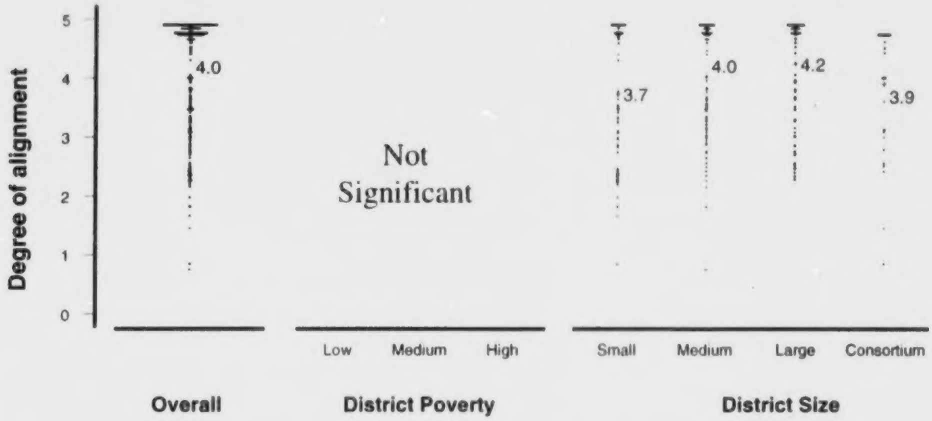
[5] As we noted earlier, district poverty and district size are always estimated together in the same model, so any significant effects for size control for poverty, and likewise any significant effects for poverty control for size.

EXHIBIT 5.1c

Degree of Alignment Between Eisenhower-assisted Activities and Standards and Assessments, Overall and by District Poverty and District Size (n=363)



	Significant Pairwise Contrasts
Size	Small vs. Large

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, teachers are in districts that have an average alignment of 4.0 on a scale from zero to five, where zero indicates no alignment and five indicates being aligned "to a large extent" with state and district standards and assessments. The degree of alignment differs significantly by district size, but not by district poverty level. Each dot represents one district. As the number districts at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

Our two case districts in Kentucky place a similar emphasis on providing professional development aligned with the Kentucky Instructional Results Information System (KIRIS), the state student assessment program used in their school accountability program. In both districts, this alignment takes the form of the district or schools selecting professional development activities designed to address areas of low performance on KIRIS. District administrators in both the Texas and the Kentucky districts repeatedly refer to their statewide assessments systems as important factors in all decisions made about professional development.

Despite the central role that state assessments often play in the design of professional development, this type of alignment does not necessarily contribute to a consistent approach to professional development. For example, one Kentucky district selects professional development activities in response to areas of weak performance by students on the previous year's state assessments. Thus, plans for professional development could change on an annual basis. During our site visit, we were told that all professional development activities would shift from mathematics to science, in response to that year's test scores. To the extent that areas of weakness in student achievement change from year to year, which is not unusual according to district officials, this approach may not support the kind of sustained professional development efforts envisioned by the Eisenhower legislation.

Both our quantitative and qualitative data illustrate the emphasis that many districts place on aligning professional development activities with state and district standards and assessments.

However, neither the survey nor the case study data allow us to evaluate all of the facets of alignment discussed by Webb (1998). For example, we did not observe professional development activities. Direct cbservation which would have enabled us to determine whether the content of these activities reflects the depth of content knowledge demanded by high standards for student performance.

One way that some districts align their professional development with state standards is to make the process of achieving such alignment a professional development activity. Several districts that we visited use Eisenhower funds to support a review of district curricula to ensure that they are aligned with state standards. At least three case-study districts, one each in Washington, Texas, and New York, use Eisenhower funds in this way. In these districts, groups of teachers, typically volunteers, meet over an extended period of time to review state standards and current district curricula to identify areas of alignment and areas in which alignment should be improved. In all three districts, this process is ongoing. Clearly, this type of professional development activity is aligned to state standards in the sense that it requires teachers to be well informed about what the state standards are and how they might translate into local curricula.

Coordination with Other Programs

Alignment is one measure of how Eisenhower professional development activities fit into districts' reform efforts. The extent to which districts work with and co-fund activities with other programs is another important measure of the integration of reform efforts in the district. Eisenhower funds support professional development activities, but so do funds from other sources—local, state, and federal. Eisenhower-assisted activities can be integrated with professional development activities funded by other sources, they can operate in isolation from these other sources, or they can operate independently but be part of a larger professional development plan. Coordination between Eisenhower coordinators and coordinators of other federal and district programs, and co-funding activities with those of other programs, can signal district attempts to build a coherent vision of professional development, or to establish a focus for potentially disparate professional development activities.

Because the relationship between Eisenhower-assisted activities and professional development activities funded through other sources conceivably can take many different forms, working relationships between the staff of the different programs may govern the relationships between programs. Thus, this section examines the extent to which Eisenhower coordinators work with others in their districts, and the extent to which Eisenhower-assisted activities are co-funded with activities funded by other federal programs.

Eisenhower Coordinators' Relationships with Others within the District Office

We asked district Eisenhower coordinators to answer questions regarding the structure of their district office, specifically to identify the positions present in their district, to identify which roles they play in their districts, and to indicate whether they work with people in other positions in making decisions about the Eisenhower program. As Exhibit 5.2 illustrates, district Eisenhower coordinators report that they do not work in isolation. Rather, they report working with other district administrators and with coordinators of other federal programs to make decisions about Eisenhower-assisted activities.

EXHIBIT 5.2

Percent of Teachers in Districts According to Eisenhower Coordinator's Roles within the District Office (n=363)

Position within District Office	Percent of teachers in districts that have the position	In districts with the position, percent of teachers in districts where the Eisenhower Coordinator fills position	In districts where the position is not filled by the Eisenhower Coordinator, percent of teachers in districts where the person in the position participates in Eisenhower decision making
General Curriculum/ Instruction Coordinator	80	48	90
Mathematics Coordinator	58	46	96
Science Coordinator	57	47	97
Professional Development Coordinator	69	39	81
Special Education Coordinator	91	8	62
Title I Coordinator	87	25	78
Federal Programs Coordinator	59	43	83

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998

How to read this exhibit: The first row shows that 80 percent of teachers are in districts that have a general curriculum or instruction coordinator; in districts with this position, nearly half of the teachers (48 percent) are in districts where the Eisenhower Coordinator fills the position; and when someone else fills the position, 90 percent of teachers are in districts where the general curriculum or instruction coordinator participates in Eisenhower decisions.

Note: There may be overlap in the positions filled by Eisenhower coordinators or positions filled by other individuals. For instance, an Eisenhower coordinator may be the district's curriculum coordinator and the district's mathematics and science coordinator. Similarly, any other individual who works closely with the Eisenhower coordinator may serve in multiple roles, for instance, as the Title I coordinator and the federal programs coordinator.

Exhibit 5.2 reflects several findings related to the nature of coordination. First, it shows that Eisenhower coordinators often serve in multiple roles. Among teachers in districts that have a curriculum coordinator, mathematics coordinator, or science coordinator position, close to half are in districts in which the Eisenhower coordinator fills these positions (48, 46, and 47 percent of teachers in districts, respectively). And among teachers in districts with a Federal Program Coordinator, 43 percent are in districts in which the Eisenhower coordinator fills the position. On average, Eisenhower coordinators report spending 23 percent of their time administering the Eisenhower program, and, though some work full-time on Eisenhower, three-quarters spend 27 percent or less of their time on Eisenhower (results not shown). The fact that Eisenhower coordinators serve in multiple roles suggests a certain amount of integration between Eisenhower-assisted efforts and other district efforts.

Second, Exhibit 5.2 suggests that when Eisenhower coordinators do not fill multiple roles, they report working closely with other district-level administrators in making decisions about how to use Eisenhower funds. Almost all teachers are in districts where Eisenhower coordinators report working closely with mathematics and science curriculum specialists (96 and 97 percent of teachers in districts, respectively). More than 80 percent of teachers are in districts whose Eisenhower coordinator reports working with the general curriculum/instruction coordinator (90 percent), the federal programs coordinator (83 percent), and the professional development coordinator (81 percent). Seventy-eight percent of teachers are in districts whose Eisenhower coordinator says they work with the Title I coordinator. Teachers are least likely to be in districts where the Eisenhower coordinator reports working with special education coordinators (62 percent).

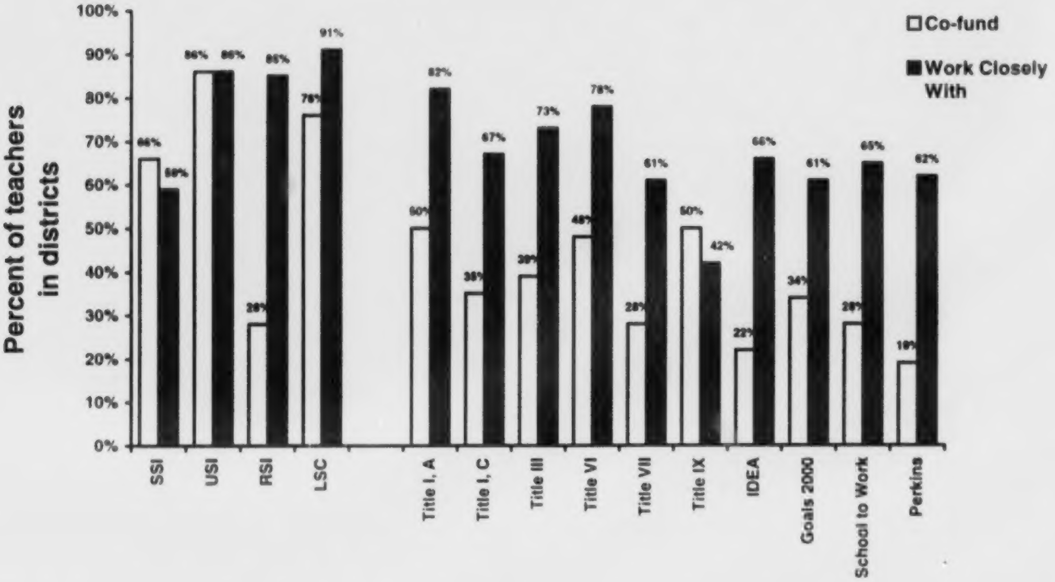
Coordination of Eisenhower-assisted Activities with Those of Other Federal Programs

In addition to reporting that they work closely with others in professional development-related roles, Eisenhower coordinators report that they work closely with the coordinators of federal education programs. We provided district coordinators with a list of NSF and ED programs, and asked them to indicate whether the program operated in their state or district, whether it supported professional development in their district in the last year (1996-1997), whether it co-funded professional development with Eisenhower, and/or if program staff worked closely with Eisenhower program staff.

As Exhibit 5.3a shows, where particular federal programs support professional development in their district, the Eisenhower coordinators report working closely with staff of the other federal programs. Although a relatively small proportion of teachers are in districts that receive funds from NSF programs, Eisenhower coordinators in these districts almost always report that they work closely with the administrators responsible for these programs. Ninety-one percent of teachers are in districts where Eisenhower coordinators report working with staff of the Local Systemic Change (LSC) initiative, 86 percent of teachers are in districts that report working with the staff of the Urban Systemic Initiative (USI), and 85 percent of teachers are in districts that report working with the staff of the Rural Systemic Initiative (RSI), in districts where these NSF programs operate. In states with NSF State Systemic Initiatives (SSI), 59 percent of teachers are in districts in which Eisenhower coordinators report working closely with SSI staff.

EXHIBIT 5.3a

Percent of Teachers in Districts in which Eisenhower Activities Coordinate (Co-fund and/or Work Closely) with Other Programs (n varies)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that, of teachers in districts with SSIs, 66 percent of teachers are in districts that co-fund with SSIs, and 59 percent of teachers are in districts in which the district Eisenhower coordinator reports working closely with the SSI. Co-funding differs significantly by both district poverty level and district size. Each bar and the number on top of it represent the percent of teachers in districts for each category.
Note: Results on co-funding for each listed program are based on districts that participate in the program, and in which the program supports professional development. Results for working closely with each program are based on districts that participate in the program.

In addition, Exhibit 5.3a shows that large proportions of teachers also are in districts where Eisenhower coordinators report working closely with coordinators of several federal programs funded by the Education Department. Notably, of teachers in districts with Title I, Part A programs (representing almost all teachers), 82 percent are in districts where Eisenhower coordinators report working closely with Title I coordinators. A similar proportion of teachers—78 percent—are in districts where Eisenhower coordinators report working closely with the coordinators of Title VI-funded activities. Of the nation's teachers in districts where other ED programs operate, between 60 and 70 percent are in districts that work closely with staff of these ED programs, with the exception of the Title III (73 percent) and Title IX (42 percent) programs.

In fact, Eisenhower coordinators report working with multiple federal education programs, where these programs exist in their districts. Our analyses of these data show that Eisenhower coordinators report that they work closely with coordinators of 65 percent of the other federal programs that operate in their districts (data not shown). In other words, in a typical district with six federal programs other than Eisenhower, the Eisenhower coordinator could be expected to work closely with the individual(s) responsible for coordinating about four of those programs.[6]

Co-funding with Other Programs

Co-funding—the contribution of funds from two programs to support the same professional development activity—is another, perhaps stronger indicator of coordination between Eisenhower-assisted activities and other federal programs. In addition to providing information about the other district personnel with whom the Eisenhower coordinator works, Exhibit 5.3a shows the percent of teachers in districts in which Eisenhower activities are co-funded with NSF and ED programs; the exhibit demonstrates that, in districts with a specific program, a substantial proportion of teachers are in districts where Eisenhower coordinators report that they co-fund professional development activities with that program.

With only a few exceptions, Eisenhower coordinators are less likely to report co-funding activities with other federal programs than they are to report working closely with those programs. This is clear from Exhibit 5.3a. Exhibit 5.3a also indicates that the Eisenhower program is more likely to co-fund with NSF-funded programs than ED-funded programs. For example, between 66 and 86 percent of teachers are in districts in which Eisenhower coordinators co-fund with three of the four NSF initiatives, whereas the maximum proportion of teachers in districts that co-fund with ED-sponsored programs is 50 percent (for Title I, Part A). One explanation of this pattern is NSF's exclusive focus on mathematics and science; since this also is the predominant focus of Eisenhower-assisted activities, there may be more opportunity for co-funding with NSF activities. Also, NSF has co-funding requirements for many of its programs, which may in part account for the higher levels of co-funding with Eisenhower. Overall, teachers are in districts that report that they co-fund professional development activities with about one-third—34 percent—of the other federal programs that support professional development in their district (results not shown).

Adding the total number of federal programs that co-fund with Eisenhower, of a possible 10, allows us to form a composite measure of co-funding to test poverty and size effects. The results, shown in Exhibit 5.3b, indicate that on average districts co-fund with two programs, and that district size and poverty interactions significantly affect co-funding. Exhibit 5.3c shows the interactions between district poverty and size for co-funding. Generally, co-funding increases as district size and poverty level increases. The exception is that for consortia, medium-poverty districts co-fund less than low-poverty districts.

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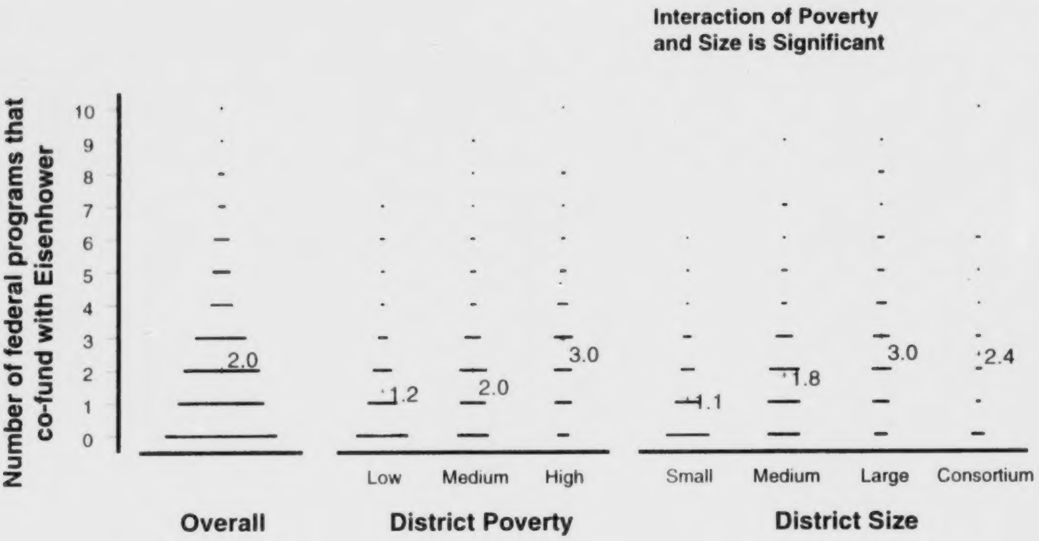
[6] It is important to note that these are not necessarily four individuals, one coordinating each program, but may be only one or two individuals, each of whom coordinates more than one other program. Similarly, the Eisenhower coordinator him/herself may be responsible for overseeing other Federal programs.

EXHIBIT 5.3b

Extent of Co-Funding of Eisenhower–assisted Activities with Those of Other Federal Programs, Overall and by District Poverty and District Size (n=363)

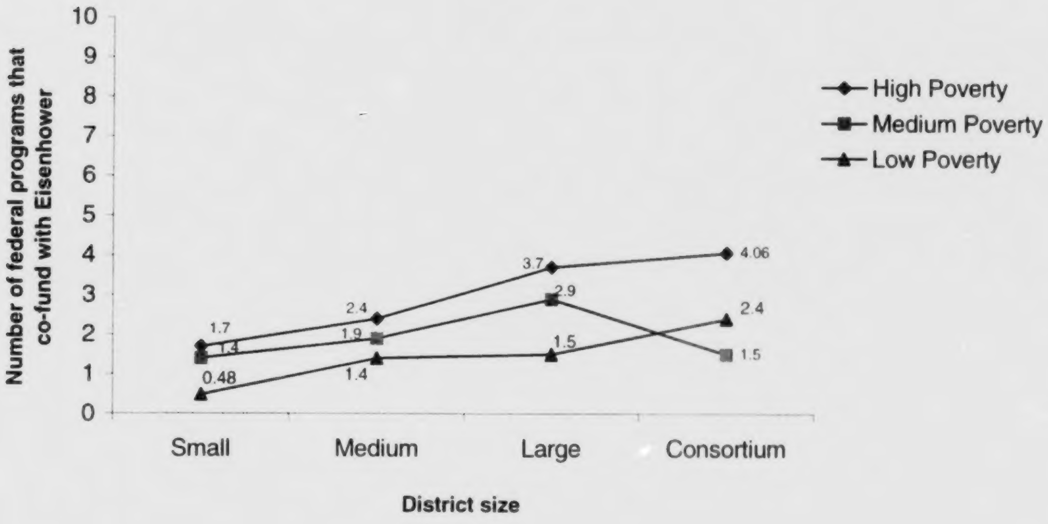


Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, teachers are in districts that co-fund with two federal programs. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

These results might be explained by the fact that high-poverty districts receive more funding that may be used for professional development from federal and some state sources whose formulas target districts with greater needs. The existence of multiple sources of funding with similar programmatic goals may create greater opportunities for coordination. Similarly, large districts and consortia may have funds from multiple sources which increase opportunities for coordination and co-funding. Large districts and consortia are also more likely to have more individuals in professional-development related roles, which may foster collaboration that results in funding activities with a combination of sources.

EXHIBIT 5.3c

Extent of Co-funding of Eisenhower-assisted Activities with Those of Other Federal Programs, Interaction of District Poverty and District Size (n=363)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The data point designated by the first square indicates that the average percent of participations in reform activities in medium-poverty small districts is 19 percent. The line with data points designated by diamonds indicates the percent of participations in reform activities for high-poverty districts in each of four sizes/types of districts (i.e., consortia, large, medium, and small districts); the line with data points designed by squares indicates the percent of participations in reform activities for medium-poverty districts for each of the four sizes/types of districts; and the line with data points designated by triangles indicates the percent of participations in reform activities in low poverty districts for each of the four sizes/types of districts.

Illustrations of Coordination in Case-Study Districts

Although our survey data provide information about the existence of coordination and co-funding, they do not allow us to judge the frequency or quality of the relationships between Eisenhower coordinators and other district administrators. Case data, however, provide information on the nature and depth of coordination and co-funding between Eisenhower coordinators and coordinators of other federally funded programs.

Our case districts provide examples of the close coordination that can occur between Eisenhower-assisted activities and those funded by NSF initiatives. In several of our case districts, Urban Systemic Initiative grants, funded by NSF, greatly expand the funding available for professional development in mathematics and science, according to district administrators. Middle City, Wisconsin, for example, has a particularly varied array of professional development activities in mathematics and science, funded from a variety of sources. Thus, the district uses all of its funding sources together to support the large variety of professional development activities. These activities rely heavily on mathematics and science resource teachers, who serve as mentors for the other teachers in their schools. Professional development funds also support semester-long workshops for teachers, opportunities for teachers to immerse themselves in mathematics or science-related industry over the summer, mini-grants to teachers to follow up on what they learned in district workshops, and school-based staff development activities. While Eisenhower funds contributed about $900,000 in 1996-97 to such activities, the district's USI contributed close to $3 million in that year and was considered an umbrella for all professional development in mathematics and science in the district.

In Middle City, the relationships between the USI and Eisenhower-assisted activities is more than just financial, because a number of the staff of the USI have been associated with Eisenhower-assisted activities for years prior to the district winning the USI. The USI's leadership includes a former Eisenhower coordinator and an Eisenhower-assisted mentor teacher. In addition, many of the USI's mentor teachers have formerly been mentor teachers funded by the Eisenhower program. It appears that, at least in this district, the Eisenhower funds have over the years developed leadership and capacity in mathematics and science that provided a foundation for the USI.

In contrast to Middle City, the relationship between Eisenhower-assisted activities and those of NSF-funded programs is not close in some other districts. Through the state's SSI, Richmond, New York's math and science teachers have access to extensive professional development opportunities, in particular summer institutes and ongoing teacher study groups. At the district level, however, coordination between the Eisenhower program and the SSI is virtually nonexistent. The district distributes the bulk of its Eisenhower funds directly to schools where school staff determine how they should be used. In the views of district administrators and teachers, professional development related to the SSI is separate from the Eisenhower funds that schools receive, and neither administrators nor teachers seem to see the district's Eisenhower funds as an opportunity to build on or expand opportunities available through the SSI.

In another district, South City, Florida, coordination between Eisenhower and USI activities damaged professional development activities in the short term, at least from the perspective of the Eisenhower coordinator and some teachers. According to the first report from this evaluation, South City, Eisenhower program activities were "subsumed by" the USI (Birman, Reeve, & Sattler, 1998, p. 31). Activities supported by Eisenhower funds tended to be shorter in duration and involve less follow-up than they had prior to their collaboration with the USI. The Eisenhower coordinator attributes this to the fact that the USI director and staff are relatively inexperienced in planning, organizing, and providing professional development. While the USI director recognizes the shortcomings of the new approach, and the Eisenhower coordinator looks forward to resolving differences in their approaches, the working relationship between the two was at least initially problematic.

Our survey data clearly indicate that coordination and co-funding are common between Eisenhower-assisted and NSF–funded activities, as we would expect since both programs focus on mathematics and science initiatives. The case of Middle City illustrates such collaboration and co-funding at its best. There, the USI and Eisenhower staff work collaboratively, and the USI benefits from the expertise and capacity built up through the years of Eisenhower funding. However, the other case study examples indicate that, while NSF funds can provide excellent opportunities for collaboration and pooling of resources with Eisenhower-assisted activities, districts do not always effectively capitalize on these opportunities.

Consistent with our survey data, we find fewer examples in our case studies of coordination with professional development funded by ED programs. One example of good coordination with an ED program is in Weller, Kentucky. There, Eisenhower and Goals 2000 funds are combined for an annual professional development project. The project always involves a teacher demonstration on a particular topic in mathematics or science. In 1997-98 the topic was finance, with primary grade teachers concentrating on money units and related mathematics skills and secondary school teachers looking at designing and marketing products. Outside providers train master teachers; in 1997-98 the training was provided by the Kentucky Math Council. Master teachers then develop two-week demonstration units. Other teachers come into a master teacher's classroom in the morning to help plan, observe the lessons, and then take the unit back to their own schools to experiment with it and to demonstrate it for their colleagues. A total of approximately 40 teachers, selected by their principals, participated in this activity. Goals 2000 provided the majority of funds for the activity, and Eisenhower funds helped pay for the training of the master teachers.

Rhinestone, Texas, also has strong coordination in several areas. The Eisenhower coordinator and the Title I coordinator in Rhinestone are both subject-area specialists, the former in math and science and the latter in language arts; two other subject-area specialists also work in the district. The four individuals discuss needs of specific schools and, on occasion, ways of encouraging curriculum integration. Each week they meet to discuss the use of Eisenhower funds in supporting Title I goals, and the Title I coordinator co-chairs the committee that decides how Eisenhower funds will be used each year.

In some other case districts, there is little or no coordination between district-level Eisenhower and Title I staff. More than one Eisenhower coordinator was surprised that we asked to interview Title I coordinators, telling us that Title I staff knew nothing about the Eisenhower program. One reason for this is the focus of Title I activities. In a number of districts, Title I focused exclusively on reading and language arts. In one district where Title I focuses on mathematics, its focus is elementary mathematics, while Eisenhower funds are viewed as mainly for secondary school teachers.

In several case-study districts, the provision of Title I funds directly to schools while maintaining Eisenhower funds at the district level is another reason for limited coordination between the two funding streams. In Lone Star, Texas, the 1997-98 school year was the first year under a new organizational system, and was a challenging one for teachers and administrators. Because district administrators were reorganized into subdistricts and most people had vastly altered responsibilities, little professional development, Eisenhower-assisted or otherwise, took place. However, other factors still point to a lack of coordination between the Eisenhower program and Title I. In Lone Star, all Title I funds are used in school wide projects, with funds devolving directly to the school level. Eisenhower funds, however, are maintained at the district level. Therefore, decisions about the two programs are not made by the same people, or even by people in the same location. This is the case in other districts as well, where there are school-wide Title I projects but district control over Title II funds.

Summary: Alignment and Coordination

Our results indicate that most teachers are in districts where Eisenhower coordinators report meeting their legislative responsibilities to align Eisenhower professional development with state and district standards and assessments, and to coordinate with others in funding and operating Eisenhower professional development activities. Aligning professional development with standards and assessments could contribute to a coherent professional development program that is focused on goals and objectives that are important for student learning, and that support high standards for learning (Smith & O'Day, 1991; Cohen & Hill, 1998). There is, however, more alignment with standards than with assessments. This may reflect the fact that the ESEA requirement of aligned assessments had not yet gone into effect at the time of our data collection, and in some places, assessments may not have been well-aligned to the standards; also, assessments have proven more difficult to develop than standards. Further, state standards and assessments have as strong a relationship to Eisenhower-assisted activities as do the more immediate district standards and assessments. One possible explanation for this is that district policy tools tend to reflect state policy tools, and so they are seen as interchangeable. It may also reflect greater stakes associated with state standards and assessments.

The high level of co-funding and collaboration with other Federal programs reported by our sample of districts suggests that Eisenhower coordinators are attempting to integrate the needs and requirements of their federal program in the design of professional development activities. This increases the district's ability to use funds efficiently and effectively. Clearly here, however, the mathematics and science focus of Eisenhower is a major explanatory factor. Coordination and co-funding is nearly twice as prevalent with NSF mathematics and science initiatives than with ED initiatives that do not share the mathematics/science focus. Furthermore, our case-study data indicate that some of the coordination between Eisenhower coordinators and those of other ED programs may be fairly superficial. Eisenhower coordinators report that coordination often consists of occasional conversations with other program administrators. Further, these conversations do not necessarily include discussion of strategies for making multiple-funding streams support each other or integrating professional development across programs.

Districts with a higher proportion of students in poverty are somewhat more likely to co-fund with other federal programs and others in professional development related roles. This might be due to the fact that high-poverty districts tend to receive money from multiple federal programs whose formulas are often designed to favor districts with larger numbers of children from low-income families. The existence of more sources of funding creates the need for more collaborative efforts in employing program funds to aid in the education of students with special needs. Thus, having multiple sources of funding and a common purpose—addressing the needs of students in poverty—may facilitate coordination in higher-poverty districts.

A more pronounced finding relates to district size. Large districts are more likely than other districts to report aligning their professional development with standards and assessments, and both large districts and consortia co-fund with other programs more than smaller districts do. Large districts and consortia may be able to incorporate effective collaborative practices because of economies of scale (e.g., investment in collaborative efforts is less expensive as the number of participants and programs increases), and also because they have larger, better infrastructures for planning and delivering professional development. Also, large districts are more likely to have subject-area specialists that are integrated into the mathematics/science community. By contrast, smaller districts may have fewer programs and personnel with which to collaborate, partly because in smaller districts the Eisenhower coordinator tends to assume several roles. Smaller districts also may not have the capacity or incentive to work across programs in the way that often becomes necessary in larger districts. If this is the case, perhaps federal technical assistance providers should consider giving smaller districts more guidance to help them organize and combine their funding streams, and collaborate with other professional development providers in their district.

The fact that most of the districts in our national profile of Eisenhower coordinators report engaging in alignment, collaboration, and co-funding indicates that they are attempting to meet the requirements of the legislation in these areas, and also are engaging in practices that have been linked to providing high-quality professional development. The coordination and alignment, however, appears to be greatly enhanced when there is a shared subject-matter focus, and in larger districts and districts with more students in poverty.

IMPLEMENTING THE VISION: DISTRICT PROCEDURES FOR THE CONTINUOUS IMPROVEMENT OF PROFESSIONAL DEVELOPMENT ACTIVITIES

Section Findings

- *Less than one-third of the nation's teachers are in school districts that have developed performance indicators to help them track the quality and effectiveness of professional development activities. Of those teachers who are in districts that do have indicators, less than a quarter are in districts that collect data on the indicators.*

- *The majority of the nation's teachers are in districts that assess teachers' needs formally; nearly all teachers are in districts that use teacher surveys to do so, and most also use less formal methods such as meetings or conversations.*

- *Most of the nation's teachers are in districts that evaluate the effectiveness of Eisenhower-assisted professional development activities. These evaluations almost always involve a teacher satisfaction survey; they are less likely to involve formally observing teaching practice or assessing effects on student achievement.*

- *Districts provide more types of guidance (e.g., assistance in interpreting Title II rules and in developing professional development plans) to schools than to other providers of professional development. Among all types of support that districts provide, they are least likely to focus on data-driven support, such as evaluations and indicators.*

The Eisenhower legislation reflects the "continuous improvement" paradigm adopted by the federal government for all of its programs. Specifically, the legislation states that "a local educational agency shall set specific performance indicators for improving teaching and learning through professional development" (Section 2208(a)(2)). This provision applies to all of the district's professional development, not just the activities supported with Eisenhower funds. The legislation also requires that each LEA "submit a report to the State every three years… regarding the progress of such agency toward performance indicators… as well as on the effectiveness of [the LEA's] activities…" supported with Eisenhower funds (Section 2401(b)). These requirements are consistent with experts' views that accountability for the outcomes of professional development is a key component of high-quality professional development (Loucks-Horsley et al., 1998).

Performance indicators are designed to evaluate district professional development efforts by establishing measurable benchmarks to track progress toward the district's goals and objectives. Of course, having such indicators then implies a process of decisionmaking in school districts that is grounded in objective data. Advocates of education reform are increasingly promoting the value of school districts' using data to make decisions about directions for teaching and learning (e.g., Bernhardt, 1998). Two provisions of the Eisenhower legislation that have the potential for encouraging districts to produce data regarding their professional development activities are the provision for assessing the needs of teachers, and the provision for assessing Eisenhower-assisted activities.

The Eisenhower legislation requires that the LEA include in its application an assessment of local needs for professional development, as identified by local education agency and school staff (Section 2208(b)). This type of needs assessment of teachers is an important first step in planning a professional development strategy that accurately addresses the strengths and weaknesses of teachers in a particular district (Loucks-Horsley et al., 1998).

Evaluating the effectiveness of Eisenhower-assisted professional development activities also should contribute to districts' tracking of progress toward professional development goals. As mentioned above, the legislation requires districts to both assess progress toward established indicators for the district as a whole, as well as to report on the effectiveness of Eisenhower-assisted district activities. Guskey (1997) notes that commonly used measures for evaluating the effects of professional development include participants' reactions to the experience; participants' actual use of knowledge and skills they have gained; and the impact of participants' changes in knowledge and skills on student learning. Guskey argues that studies of professional development ought to focus less on teacher perceptions and reactions and place greater emphasis on teacher and student outcomes of professional development.

Thus, Eisenhower requirements for establishing indicators, assessing the needs of teachers, and evaluating Eisenhower-assisted activities are some of the ingredients in the legislation that could support a data-based continuous improvement process. Knowledge and use of indicators should provide target goals and benchmarks for measuring progress. Information about teachers' needs should assist in setting the goals and objectives for professional development. Evaluation data should provide one means for determining whether professional development activities are moving teachers toward these goals.

However, to have an effect on the design of professional development activities, continuous improvement means more than establishing goals, measuring progress toward these goals, and evaluating professional development activities. Continuous improvement also means communicating with schools and teachers about state and district standards and assessments, sharing the data collected from needs assessments and evaluation, and establishing goals and indicators for professional development. The term continuous improvement implies a "feedback loop" in which data about progress are part of continuous communication, and where data become part of a discussion about strengths and weaknesses, and future strategies and decisions.

Thus, in addition to establishing indicators, assessing teacher's needs, and evaluating the effectiveness of professional development activities, another important role that districts may have is to offer guidance, support, or technical assistance to those who are involved in planning and implementing professional development. Schools often have a role in planning and implementing professional development activities, and districts may play a role in helping to familiarize schools with the standards and expectations of districts, state administrators, and policy makers, as well as with data from district data collection efforts. Furthermore, in addition to school staff, district staff, outside consultants, or individuals from other organizations such as teacher centers or regional service centers operated in some states may be providers of professional development activities. Some providers may be unfamiliar with the district's vision and goals. In these cases, district data about their performance, and guidance about district goals and policies, could help these providers integrate their activities with district goals and standards. District support to school staff and other providers of professional development can help to enable teachers and schools to have professional development choices that fit within the state and districts' overall vision and focus. In requiring districts to establish goals and objectives for professional development, assess needs of teachers, track progress toward goals, and evaluate the effects of professional development activities, the Eisenhower legislation highlights the role of the district in supporting professional development activities. In these provisions, the legislation is consistent with recent literature on school reform, which also emphasizes the critical role of school districts in guiding professional development (Elmore & Burney, 1996; Spillane & Thompson, 1997).

In this section, we use our national profile of Eisenhower coordinators to examine the aspects of Eisenhower-assisted professional development that relate to performance indicators, needs assessments, evaluations of Eisenhower-assisted activities, and the provision of guidance to schools and professional development providers. We describe how successful districts are in meeting the Title II requirements for having performance indicators in place and collecting information on these indicators, and examine whether districts know about and use state-level performance indicators in their evaluation and improvement process. We describe the ways in which districts collect information about needs for professional development, and whether and how districts evaluate their Eisenhower-assisted professional development activities. Finally, we describe the ways in which districts provide guidance to schools and professional development providers regarding Eisenhower-assisted professional development activities.

Presence and Use of Performance Indicators

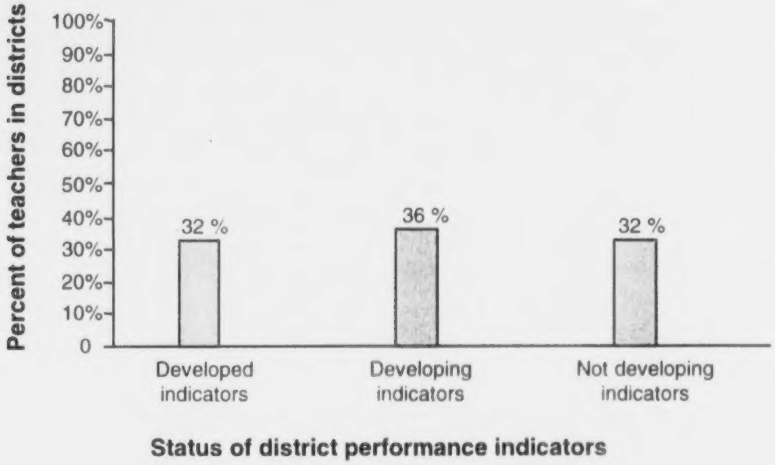
We asked Eisenhower coordinators if their district had developed, or was currently developing, performance indicators for professional development. Data from the national survey of district Eisenhower coordinators are somewhat discouraging with respect to district response to the requirements for having and using performance indicators. Some district Eisenhower coordinators continue to be unaware of the requirements, or, if they are aware of them, they have not yet acted on them. As Exhibit 5.4 illustrates, less than a third (32 percent) of the nation's teachers are in districts that have performance indicators in place.

Of teachers who are in districts that have already developed performance indicators (32 percent), 60 percent are in districts that report that they collect data on those indicators to measure progress; an additional 40 percent of teachers are in districts that say they have plans to do so (data not shown). In other words, fewer than one in five, or about 18 percent, of teachers are in districts that currently collect data on performance indicators that they have established to guide their professional development efforts.

While most of the nation's teachers are in districts that have not yet developed district-level performance indicators, district efforts to plan, evaluate, and track the progress of their professional development activities could benefit, in principle, from indicators developed by their states. However, a majority of teachers are in districts where Eisenhower coordinators are not aware of any performance indicators developed at the state level; only 34 percent of teachers are in districts where coordinators report that they knew of state-level indicators. Of these, 70 percent of teachers are in

EXHIBIT 5.4

Percent of Teachers in Districts According to Status of District Performance Indicators for Professional Development (n=363)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 32 percent of teachers are in districts that report that they have developed performance indicators. Each bar and the number on top of it represent the percent of teachers in districts for each category.

districts in which district Eisenhower coordinators report that the state indicators affect their use of Eisenhower funds or other district activities (data not shown). In other words, less than 25 percent of the nation's teachers are in districts that report being affected by their states' indicators for professional development.

Of the district Eisenhower coordinators who say that the state indicators affect their districts, coordinators report that state indicators affect the district in the following ways (these answers were in response to an open-ended question that asked in what ways, if any, are indicators used to guide change in Eisenhower-assisted professional development activities):

- help the district assess school, teacher, and/or overall district needs,
- help the district focus and plan its use of Eisenhower funds,
- influence the types and characteristics of Eisenhower-assisted activities (i.e., duration, in-district versus out-of-district, workshop versus institute),
- encourage districts to strive to meet state standards, and
- provide a measure for districts to use to evaluate their performance.

In general, the district case studies mirror results from the district survey findings. There is a lack of awareness of the states' performance indicators. Three of the five case-study states collect data from districts regarding the state's indicators. Case-study districts in these states supply the requested information to state coordinators, but they do not perceive the data as part of a system of evaluating progress toward state or district goals for professional development. In at least two of the case-study states, districts are required to select a subset of the state indicators and report their progress on them. However, district Eisenhower coordinators do not consider those indicators they report on to the state to be their district's performance indicators, and these indicators do not appear to be in any way guiding the districts in their planning and evaluation of professional development. Only one of the six districts in these states had "developed" indicators—and that district adopted a subset of the state's indicators as its own.

Assessing the Needs of Teachers

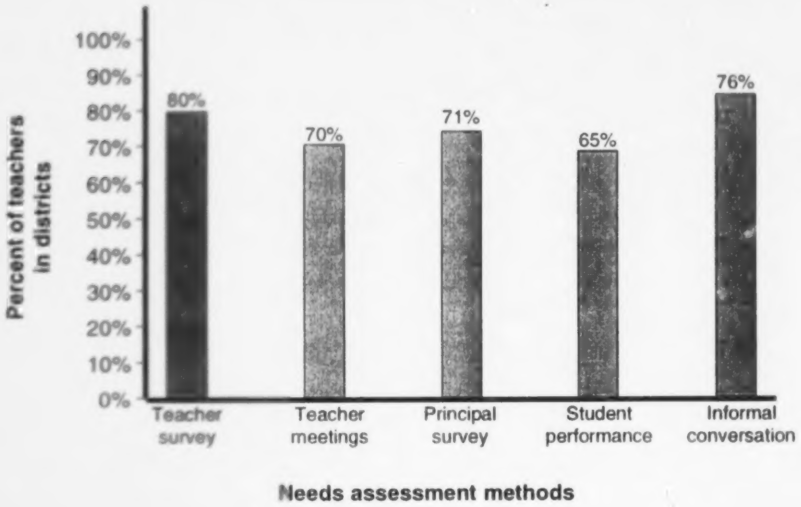
In addition to establishing indicators, obtaining information about the needs of teachers is a first step in planning for professional development, and as mentioned earlier, the legislation requires that districts conduct needs assessments. We asked district Eisenhower coordinators if teachers' needs for professional development are assessed, and if so, in which ways they are assessed (note: this question applies to all types of professional development, not just Eisenhower-assisted professional development). Options on the survey were: 1) with a survey of teachers, 2) with meetings of teacher representatives, 3) with a survey of principals or department chairs, 4) with measures of student performance, and 5) with informal conversations.

Just under 85 percent of teachers are in districts where coordinators say that they formally assess teachers' professional development needs (data not shown). As Exhibit 5.5 shows, most of the districts use several methods for assessing needs. Teacher surveys are the most popular method; 80 percent of teachers are in districts that formally assess needs using this method. Between 70 and 76 percent of teachers are in districts that use meetings with teacher representatives, surveys of the principal or the department chairperson, and informal conversations, and 65 percent of teachers are in districts that use measures of student performance to determine teachers' professional development needs. Our survey data do not yield information on how often needs assessments of the various types are used or how heavily districts rely on these different methods.

In our case-study districts, however, we find examples of how these approaches to assessing needs are used. Six of our case sites conduct some type of teacher survey to identify teacher needs for professional development. For example, needs assessment appears to rely exclusively on a teacher survey in Weller, Kentucky. There, teachers are asked about future needs for professional development at the end of their evaluation of professional development activities. Last year, the following were among the most frequently mentioned needs: more planning time in order to implement new ideas; information on how to use and integrate technology into the curriculum; strategies to work with students with special needs; information on working in classrooms with students of varying ages and ability levels; help in collaborative and cooperative learning; time management; new and current literature on teaching and learning; and stress management. Such information, and evaluations of teacher satisfaction with professional development activities, are the basis for planning Eisenhower-assisted activities, which in this district is done almost entirely by the Eisenhower coordinator herself.

EXHIBIT 5.5

Percent of Teachers in Districts That Use Different Methods to Assess Teachers' Professional Development Needs (n=363)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 80 percent of teachers are in districts that report using teacher surveys as a method of needs assessment. Each bar and the number on top of it represent the percent of teachers in districts for each category.

These examples of the variation of needs that teachers identify highlight the challenge in aligning teachers' needs with district standards, and addressing potential differences between the two sources. Relying exclusively on teachers' assessments of their own needs may be problematic, because teachers' perceptions of their weaknesses are influenced by their instructional philosophy and goals, which may not be consistent with district standards and goals.

Student test scores are the main source of needs assessment data in some districts, though sometimes they are used in combination with other sources of information. For example, in Rhinestone, Texas, the needs of teachers are determined by a combination of informal conversations, in person and by telephone, "walk throughs" by district staff in order to observe and talk with teachers, and an analysis of TAAS scores. Teachers call district staff to express their needs, and their opinions about the types of professional development that they would like. But, according to district administrators, academic achievement, as measured by the Stanford 9 and TAAS scores, often determine who is targeted for professional development and the type of professional development that is needed. District administrators indicate that reliance on student achievement tests to guide professional development needs is more possible for mathematics than science in some districts, because students are tested more often in mathematics than in science.

Evaluating Professional Development Activities

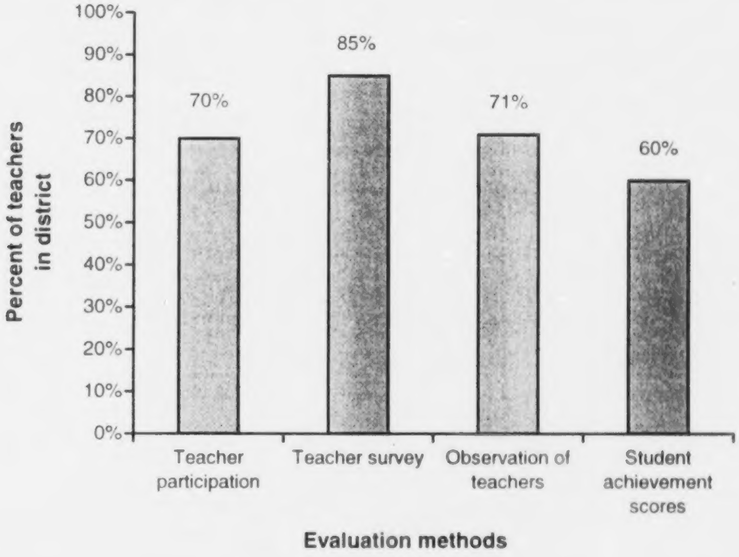
Another mechanism for continuous improvement is evaluation. Most teachers (93 percent) are in districts in which district Eisenhower coordinators report that they evaluate their Eisenhower-assisted professional development activities (data not shown). Given that assessment of these activities against performance indicators is required in the authorizing legislation, it is perhaps surprising that as many as seven percent of teachers are in districts that acknowledge that they do *not* evaluate Eisenhower-assisted professional development.

Districts report that they evaluate Eisenhower-assisted professional development in a number of ways. We asked district coordinators to indicate which of the following ways they evaluate the activities: 1) by number of teachers participating in professional development, 2) with a teacher satisfaction survey, 3) with observations of teachers, and 4) with student achievement scores. We did not ask the frequency with which districts use these evaluation methods; districts may use some of them only occasionally.

Exhibit 5.6 shows that 85 percent of teachers are in districts that evaluate Eisenhower professional development activities using a teacher satisfaction survey.

EXHIBIT 5.6

Percent of Teachers in Districts That Use Different Methods to Evaluate Eisenhower-assisted Activities (n=363)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 70 percent of teachers are in districts that report using counts of teacher participation as a method for evaluating their Eisenhower-assisted professional development activities. Each bar and the number on top of it represent the percent of teachers in districts for each category.

Approximately three-fourths of teachers are in districts that evaluate activities by the number of teachers who participate (70 percent) and by observing the classroom practices of teachers who have participated (71 percent). The least popular method is using student achievement data to evaluate the effects of professional development, although 60 percent of teachers are in districts that report using this method.

Our case districts appear to reflect our national data in the evidence for reliance on teacher satisfaction surveys to evaluate the outcomes of professional development activities. For example, Maple City, Ohio, uses a standard teacher satisfaction form to evaluate professional development activities. The form asks teachers whether they agree with the following statements:

1. This inservice dealt with a priority issue.
2. The goal(s) of the inservice were clearly stated by the presenter(s).
3. The stated goals(s) of the inservice were achieved.
4. The information was clearly presented.
5. I will modify my teaching behavior as a result of this inservice.
6. The information presented will assist me in my job.
7. A portion of the inservice time was set aside for questions and answers.
8. I believe there was sufficient input from staff in planning this inservice.

Teachers are also asked to respond to three open-ended questions:

1. What was the most valuable part of this inservice?
2. In what ways could this inservice have been improved?
3. Additional comments.

In other case sites, as well, evaluation of professional development involved teacher satisfaction surveys that asked questions similar to those on the Maple City survey.

While our national sample of district Eisenhower coordinators frequently cites the use of observation of teachers and student achievement data as a means for evaluation, our case-study data indicate that districts do not observe teachers or use student data in a formal, systematic way to evaluate the outcomes of professional development activities. Boonetown, Kentucky, is not unusual in its use of student assessments to evaluate professional development activities. There, in addition to teacher satisfaction surveys, professional development is considered successful if KIRIS scores increase in the targeted areas. While this is an outcome-based strategy for evaluation, it can be considered a remediation approach rather than a capacity-building approach; it appears to neglect two critical central steps—*an objective assessment of the quality of the professional development activity, and the evaluation of the effects of professional development on teaching itself.* In neglecting these two areas, the attribution of test score increases to Eisenhower professional development is tenuous. In the sequence of steps from needs assessment, to setting goals, to designing and participating in professional development, to changes in teaching, to student learning, to student outcomes, we find that none of our case districts systematically observe teachers' practices after they have participated in professional development activities in a systematic way.

Some coordinators in our case districts state that they observe teachers, but their observations appear to be informal. For example, in Rhinestone, Texas, the Eisenhower coordinator visits classrooms to observe teachers who have recently been through training to see if new ideas are in use in the classroom. On the whole, her evaluation seemed cursory to our case visitors. While she visits each classroom and uses an NCTM checklist of effective classroom practices for criteria, she relies primarily on anecdotal notes to record her observations. She explains that her goal is not to make teachers feel that they are being evaluated, but rather to send a message of assistance and support to teachers. Further, as we reported earlier, in this and other districts, one criterion for evaluating professional development in the schools is students' academic achievement. However, without rigorous, longitudinal, well-designed studies, it is difficult to attribute students' test score increases to teachers' professional development experiences.

District Support and Guidance to Schools and Professional Development Providers

Continuous improvement means setting goals, collecting and reporting measurable indicators of progress, assessing the needs of teachers, and evaluating professional development activities. However, it also means communicating goals and evaluation results with those who provide professional development, so that they are able to incorporate district goals into their professional development plans, and know how their activities will be judged. Professional development activities often are provided by schools, or by district staff or individuals hired by the district. Institutions of higher education and nonprofit organizations also frequently provide professional development to teachers in districts; and districts may work with these organizations in various ways to offer them guidance and support.

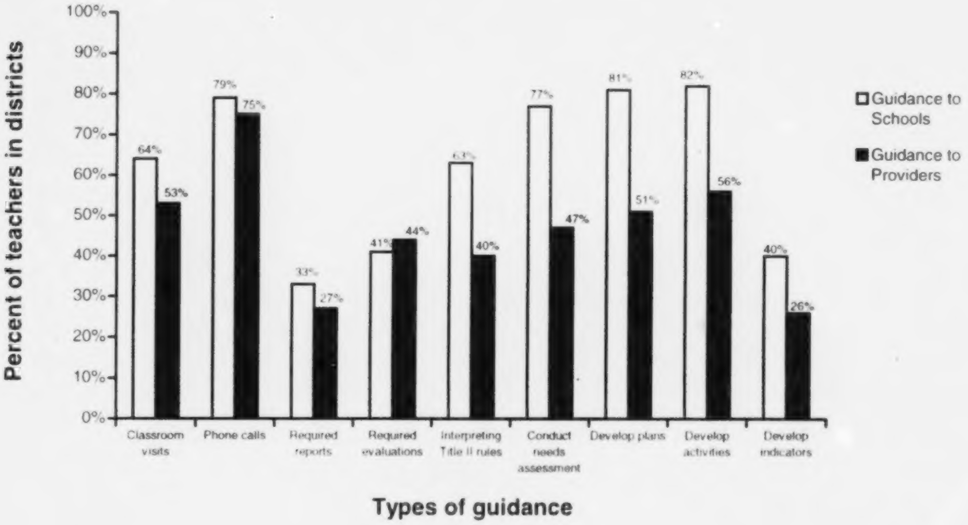
To find out about the types of support and guidance that districts offer to schools and professional development providers, we asked district Eisenhower coordinators a number of questions about the types of communication they have with schools and with providers of professional development and the guidance they provide to schools and other professional development providers. Specifically, we asked coordinators in which of the following ways district Eisenhower staff exchange information with schools regarding professional development: regular visits and observations, telephone calls, required reports, and/or required evaluations. We also asked them which of the following five types of assistance they provide to schools: guidance in interpreting Title II rules, help conducting needs assessments, help developing professional development plans, help developing specific activities, and help developing performance indicators for professional development.

On average, districts provide more guidance to schools than to providers of professional development. Districts report providing 6.2 of the nine types of support to schools and 4.6 to providers. Standard deviations are quite large (2.6 for schools and 3.4 for providers), which suggests that there is a large variation in the number of ways that districts provide guidance (data not shown).

As illustrated in Exhibit 5.7, districts are about equally likely to provide support to schools as to providers in the form of classroom visits, phone calls, and required reports and evaluations. However, teachers are much less likely to be in districts that provide the other types of guidance (i.e., interpreting Title II rules, conducting needs assessments, and developing professional development plans and activities indicators) to providers of professional development than to schools. Also, districts provide fewer data-related types of support (e.g., reports and evaluations) than other types of support, to both schools and professional development providers. Although these data provide information about whether or not district coordinators engage in particular types of support and guidance, we have no information on the quality or frequency of these activities.

EXHIBIT 5.7

Percent of Teachers in Districts in Which Eisenhower Staff Provide Different Types of Guidance about Professional Development to Schools and Professional Development Providers (n=363)

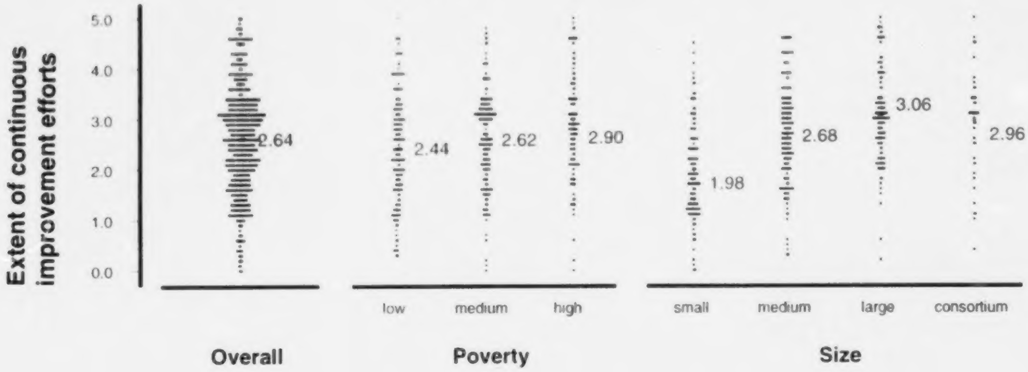


Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 64 percent of teachers are in districts that report using classroom visits as a type of guidance that Eisenhower staff provide to their schools, and 53 percent of teachers are in districts that report using classroom visits as a type of guidance to professional development providers. Each bar and the number on top of it represent the percent of teachers in districts for each category.

To measure the extent to which districts differ on all continuous improvement measures, we created a composite of indicators, needs assessment, evaluation, and guidance to schools and professional development providers. We standardized the variables comprising each of these five measures, adjusted the values to be on a zero to one scale, and then summed them to form an overall continuous improvement composite. Exhibit 5.8 shows that there is significant variation in continuous improvement according to both district size and poverty level. Small districts employ significantly fewer continuous improvement efforts than either consortia or large and medium districts, and medium districts employ significantly fewer continuous improvement efforts than large districts. Similarly, low-poverty districts have fewer continuous improvement mechanisms than high-poverty districts. Again, these results may reflect that large districts have more staff and a more comprehensive professional development program, which requires more systematic monitoring and evaluation. Similarly, high-poverty districts are more likely to have support from other federal programs, such as Title I, Part A, which also emphasize the use of indicators, needs assessments and evaluation.

EXHIBIT 5.8

Extent of District Continuous Improvement Efforts, Overall and by District Poverty and District Size (n=363)



	Significant Pairwise Contrasts
Size	Small vs. Medium, Small vs. Large; Small vs. Consortium; Medium vs. Large
Poverty	Low vs. High

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that teachers are in districts that report an average continuous improvement score of 2.6, where 0 indicates no continuous improvement efforts, and five indicates the largest extent of continuous improvement efforts. Continuous improvement differs significantly by both district poverty level and district size. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

Summary: Continuous Improvement

Most districts do not have performance indicators and many remain unaware of the requirement to develop performance indicators and of the purposes underlying state indicators and data collection activities, although Congress' intent is clear in these provisions to establish and measure progress on performance indicators. Strategic planning that includes developing goals and objectives and delineating how progress toward achieving these goals will be measured is key to a successful professional development program (Loucks-Horsley et al., 1998). Clearly, there is room in this area for a heightened federal role in assisting states and districts to learn how to develop well-constructed indicators, how to collect meaningful data, and how to use the indicators as part of a system of continuous improvement.

Our national survey data also show that while most districts collect information about the needs of teachers, and evaluate Eisenhower-assisted professional development activities, as required by law, their approaches to these activities are not as strong as they could be. Our survey and case-study data reveal that district needs assessments and evaluations are typically based on teacher surveys. This heavy reliance on teacher reports does not take into account the potential differences between teachers' instructional goals and district goals and standards. Further, teachers may not be

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able to identify their own weaknesses, and even if they can, they may not be able to identify appropriate measures to address the weaknesses.

Districts also tend to use classroom observations and student achievement data in needs assessment and evaluation, but not in rigorous and systematic ways. Most districts do not have the resources to use these approaches effectively. Studies that link professional development with student outcomes would require costly long-term data collections and an evaluation capacity that many districts do not have; these types of evaluations are better conducted as part of well-designed research studies. It seems more appropriate and effective for districts to focus their evaluations on assessing how well their professional development activities reflect high-quality structural and core features. This can be done through carefully crafted teacher surveys that ask teachers specific questions about the contact hours, duration, active learning opportunities, content focus, and coherence of the activity, as well as through direct observation of the activity.

Districts do often provide guidance to schools and professional development providers. However, despite the need to use data to make decisions about professional development activities, districts do not appear to communicate often to schools and professional development providers about indicators and evaluations. There are a number of possible reasons for this. First, district Eisenhower coordinators themselves may not be trained as evaluators, and may not be familiar with uses of data to judge their progress. Second, a number of Eisenhower coordinators in our case districts indicate that they are aware of the deficiencies of their approaches, but do not have adequate resources to conduct more thorough evaluation and data collection activities. Considering the critical nature of the requirements to establish indicators and to evaluate Eisenhower-assisted activities, it may be helpful to determine more definitively what the barriers are to establishing indicator systems and high-quality evaluations, and to provide guidance and assistance to help the districts overcome these barriers.

THE ROLE OF TEACHERS IN PLANNING PROFESSIONAL DEVELOPMENT

Section Findings

- *Most teachers are in districts that report professional development being planned at both the school and district levels.*

- *Most teachers are in districts where teachers are involved in planning professional development in a variety of ways, such as through teacher committees, needs assessments, or informal consultation.*

- *While most districts rely on schools to plan some professional development activities, districts vary widely in their interpretations of the "80-20" rule. Some districts interpret the rule to require that 80 percent of funds be allocated directly to schools. Others interpret the rule to mean that most Eisenhower activities occur at the school site. Still other districts interpret the rule to allow 80 percent of activities to be determined by district-wide assessments of teacher needs. Currently, all of these interpretations are correct, according to the Department of Education.*

Aligning professional development activities with standards and assessments, and coordinating with activities funded by other programs, can be part of building a vision for how professional development can support school reform. Once such a vision is established, continuous improvement activities, such as establishing indicators and collecting data about teacher needs and the effectiveness of professional development activities, can be important to implementing this vision. Another aspect of building and implementing a vision for professional development is involving teachers in planning professional development activities.

The Eisenhower legislation pays special attention to involving teachers and school staff in planning professional development activities. Such planning can occur at any level of the formal school district hierarchy, and can involve teachers and other school staff in a variety of roles. For example, administrators can plan professional development activities at the district level, with the advice of teachers, or using information from teachers about their needs. Alternatively, professional development can be planned at the school level, by full faculties or by teacher representatives, or by principals without the involvement of teachers. Additionally, in school districts, decisions about professional development may be made at some level in between the district and the school, by "clusters" of schools. These clusters may be "feeder patterns" (a high school and the elementary and middle schools that "feed" it), or they may be some other group of schools (e.g., all high schools or all elementary schools in the district). As with district and school-level decisions, cluster-level decisions can involve teachers in a variety of roles. At whatever level, the goal of planning for professional development is to design activities and experiences that improve the quality of teaching and learning by supporting the needs of teachers.

Whether the planning for professional development occurs at the district, cluster, or school levels, the odds of meeting teacher needs are increased if teachers are involved in the planning. Experts agree that teacher involvement in planning contributes to high-quality professional development (Clark, 1992). Teacher involvement in planning can help ensure that professional development addresses the skills that they need, and employ the learning strategies that they find most useful (Clark, 1992; Loucks-Horsley et al., 1998).

Echoing this idea, the Eisenhower legislation calls for involving teachers and other school-level staff in planning professional development activities at the district level and Eisenhower-assisted activities at the school levels. The law requires that each LEA's professional development plan be

> …developed with the extensive participation of administrators, staff, and pupil services personnel, which teachers shall also be representative of the grade spans within schools to be served and of schools which receive assistance under part A of Title I (Section 2208(c)(2)).

However, the needs of teachers as individuals may not be the only needs that professional development activities should address. Recent literature suggests that professional development should support both the needs of individual teachers and those of schools as a whole (Loucks-Horsley, 1998). Much of the current research base on school reform emphasizes the importance of approaches that involve improving whole schools (e.g., Bodilly et al., 1996, 1998; Herman et al., 1999; Slavin et al., 1996). Having all teachers in a school share a knowledge base, as well as share expectations for teaching and learning, facilitates teaching and learning toward high standards (O'Day & Smith, 1993). In order to improve, schools may have to address needs that go beyond the needs of their individual teachers. Furthermore, researchers and policy makers are currently emphasizing the importance of professional development that is embedded in the daily life of teachers (Guskey, 1997; Loucks-Horsley et al., 1998). As a result, they have focused on the school as the logical unit for both planning and implementing ongoing professional development activities (Guskey, 1997; Senge, 1990; Shanker, 1990).

Reflecting this view, the Eisenhower legislation appears to stress the importance of school-level planning and implementation of Eisenhower-assisted activities, in addition to requiring that teachers participate in planning Eisenhower-assisted activities. The legislation specifically states that LEAs

> shall use not less than 80 percent of such [Eisenhower Professional Development Program] funds for professional development of teachers, and, where appropriate, administrators, and, where appropriate, pupil services personnel, parents, and other staff *of individual schools* in a manner that (A) is determined by such teachers and staff; [and] (B) to the extent practicable, takes place *at the individual school site* (Section 2210(a)(1)). [emphasis added]

This provision, which we refer to as the "80-20 rule," seems to reflect the Congress' conclusion that decisions about professional development are best made by school-level staff.

This section of the chapter examines how districts plan professional development activities, with a focus on the roles of school staff, particularly teachers. We present findings on the levels at which planning for professional development occurs and how districts involve teachers in such activities. We then discuss how districts interpret the legislation's provisions that deal with participation of school staff in planning professional development.

Levels of Planning for Professional Development

We asked coordinators to tell us how many (i.e., "none," "some," "most," or "all") of their district's Eisenhower-assisted activities are planned at the district, school, and cluster level. Exhibit 5.9a indicates the proportion of teachers who are in districts where activities are planned at each of these three levels.

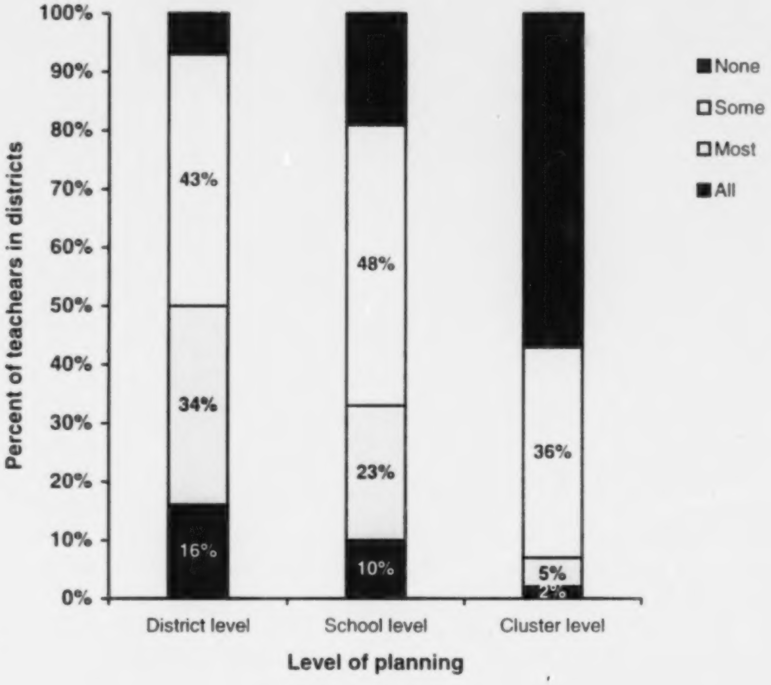
As Exhibit 5.9a shows, 43 percent of teachers are in districts where Eisenhower coordinators estimate that "some" of their Eisenhower-assisted activities are planned at the district level, and 34 percent are in districts where "most" are. Only seven percent of teachers are in districts where no Eisenhower-assisted activities are planned at the district level, and 16 percent are in districts where all activities are planned at the district level.

Over half of all teachers (57 percent) are in districts that are not organized in clusters for planning and administering professional development, and thus report no planning at the cluster level. Thirty-six percent of teachers are in districts that plan "some" professional development at the cluster level, but only five percent are in districts that plan "most" activities at the cluster level, and two percent are in districts in which "all" of the professional development is planned at the cluster-level.

Exhibit 5.9a also shows that 48 percent of teachers are in districts where "some" Eisenhower-assisted activities are planned at the school level, while 23 percent of teachers are in districts where "most" of these activities are planned at this level. Nineteen percent of teachers are in districts where no professional development activities are planned at the school level, while 10 percent of teachers are in districts where "all" such activities are planned at the school level.

EXHIBIT 5.9a

Percent of Teachers in Districts Reporting That None, Some, Most, or All Professional Development Activities Are Planned at the District, School, and Cluster Levels (n=363)



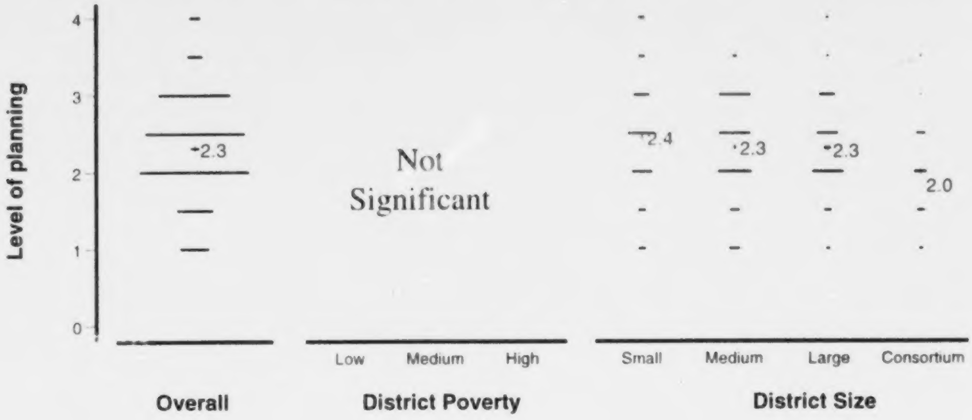
Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that seven percent of teachers are in districts that do not plan *any* of their activities at the district level; 43 percent of teachers are in districts that plan *some* of their professional development at the district level; 34 percent of teachers are in districts that plan *most* of their professional development at the district level; and 16 percent of teachers are in districts that plan all of their professional development activities at the district level. Each bar represents the average percent of teachers in districts for each category. The number at the top of each section of the bar is the mean.

In short, a small proportion of teachers are in districts that plan all of their professional development activities at the school or district level. Many districts, however, plan professional development activities at both the district and school level.

To examine whether there are differences in school-level and district-level planning according to poverty level and size of the district, we created a measure of school-level vs. district-level planning. It is a scale from 0 to 4, where four indicates districts where all planning is done at the school level and no planning is done at the district level, and 0 indicates districts where no planning is done at the school level and all planning is done at the district level. Medium and small districts are more likely than consortia to plan activities at the school level; but there are no differences by poverty, as illustrated in Exhibit 5.9b. It makes sense that consortia would be more likely than single districts to plan at the district level, since consortia by definition are a group of districts working together. Further, since consortia may be more focused on across-district planning, school-level planning may not be emphasized as much as in single districts.

EXHIBIT 5.9b

Extent to Which Professional Development Activities Are Planned at the School vs. District Level, Overall and by District Poverty and District Size (n=363)



	Significant Pairwise Contrasts
Size	Small vs. Consortium, Medium vs. Consortium

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first distribution shows that on average, teachers are in districts that report an average school-level planning score of 2.3, where zero=all *district* level planning and four=all *school* level planning. The extent of school- vs. district-level planning differs significantly by district size but not by district poverty level. Each dot represents one district. As the number of districts at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

Teacher Involvement in Planning

Involving teachers in different aspects of planning is important for fostering high-quality professional development, and is emphasized by the Eisenhower legislation. To find out how and to what extent teachers are included in planning, we asked district Eisenhower coordinators if teachers are included in planning Eisenhower-assisted professional development, and in what ways they are included at each level (i.e., district, cluster, and school). We asked which of the following describes the roles teachers play in making decisions about Eisenhower-assisted activities planned at the *district* level: 1) teachers participate in a formal planning committee, 2) teachers are consulted informally, 3) teachers are consulted in a needs assessment, and/or 4) teachers do not play a regular role.

Virtually all teachers (99 percent) are in districts that report that teachers are involved in the planning process (data not shown). Of teachers in districts that report any teacher involvement in planning, 88 percent of teachers are in districts that involve teachers in district-level planning through needs assessments and informal consultation (data not shown). A much smaller proportion of teachers, 65 percent, are in districts that report having teachers directly involved in district-level planning by participating on formal committees (data not shown). Planning through membership on

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a formal committee can be considered to be a much more active form of involvement in planning than through needs assessment or informal communication; thus, the most direct and formal type of teacher involvement is the least common.

We asked coordinators which of the following people participate in making decisions about Eisenhower-assisted activities planned at the *school* level: 1) lead teachers, resource teachers, or department chairs, 2) classroom teachers, through a formally organized committee, and 3) teachers as individuals. We asked the same questions about *cluster*-level planning.

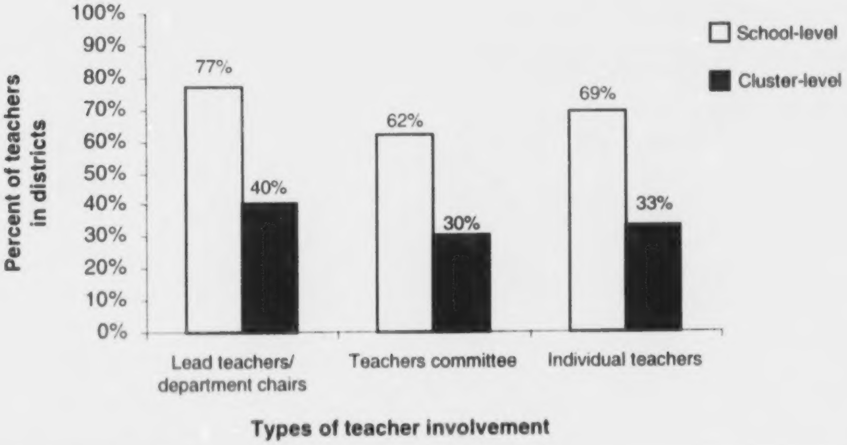
The findings, reported in Exhibit 5.10, suggest that most districts involve teachers in the school- or cluster-level planning process in more than one way, and that teachers are more involved in school-level planning than cluster-level planning. For example, 77 percent of teachers are in districts in which lead teachers, resource teachers, or department chairs participate in school-level planning, while only 40 percent of teachers are in districts that report participation of this type of teacher in cluster-level planning. For both cluster- and school-level planning, the most likely to participate are lead teachers, resource teachers, or department chairs, followed by teachers as individuals. Once again, as with district-level planning, participation on a teacher committee is the least common form of teacher participation; 62 percent of teachers are in districts that report teacher participation in planning through formal committees for school-level planning. Thirty percent of teachers are in districts that report planning participation through formal committees for cluster-level planning.

Because we asked about teachers' formal involvement on committees in planning Eisenhower-assisted professional development at the district, cluster, and school levels, we are able to examine differences in this type of involvement across levels. This formal involvement on committees often represents more responsibility and potential influence for the teacher than needs assessments or informal involvement. For all districts, we find that 65 percent of teachers are in districts in which teachers participate in formal committees at the district level (data not shown), and 62 percent of teachers are in districts in which teachers participate in formal committees at the school level; this difference is not statistically significant (data not shown). Thus, teachers are just as likely to participate in formal committees at the district level as the school level.

Further, for the districts in our sample with clusters, 69 percent of teachers are in districts in which teachers participate in formal committees at the district level, 56 percent are in districts in which teachers participate at the cluster level, and 69 percent are in districts in which teachers participate at the school level (data not shown). Here the differences between clusters and districts, and clusters and schools, are statistically significant, indicating that teachers are significantly less likely to participate in committees at the cluster level than at either the school or district level. These findings reveal no evidence of greater teacher involvement as planning gets closer to the school level, since teachers' formal involvement in planning is similar when professional development is planned either at the school or district level; but cluster-level planning does not, on average, involve as much teacher participation. This may reflect the organizational or management structure of cluster-level decision-making, which may be more likely to have district staff and administrator involvement because of the need to address issues across schools or groups of schools. However, district-level planning also must address across-school issues, so it is unclear why cluster-level planning involves significantly less formal teacher participation.

EXHIBIT 5.10

Percent of Teachers in Districts with Different Types of Teacher Involvement in School- and Cluster-level Professional Development Planning (n=363)



Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
How to read this exhibit: The first bar shows that 77 percent of teachers are in districts where teachers/department chairs are involved in school-level planning. The second bar shows that 40 percent of teachers are in districts where teachers/department chairs are involved in cluster-level planning. Each bar and the number on top of it represent the percent of teachers in districts for each category.

In order to test whether formal teacher involvement in planning through committees differs according to the district poverty level or district size, we developed a scale to measure the overall extent of this form of teacher involvement in planning. The measure is an additive composite of district reports of teachers' participation through formal committees at the district, school, and cluster levels. The composite is a function of whether teachers are involved in planning at each of the three levels, weighted by the extent to which activities are planned at the three levels (i.e., coordinators indicated whether some, most, or all of their activities were planned at a particular level). Analysis of the composite indicates that on average, teachers are in districts that involve teachers in the planning process through committees in two-thirds of the levels at which activities are planned (data not shown). There are no statistically significant differences according to district poverty level and district size.

Our case data illustrate how different districts involve teachers in planning professional development activities. A few of our case districts rely only on teacher needs assessment surveys for planning professional development activities, sometimes augmented by informal conversations with teachers. In other districts, teachers take a more active role as members of teacher committees. Data from the following case districts illustrate how teachers' committees can be involved in planning for professional development at the school or district levels.

In West City, California, a district committee, or "implementation team," of up to 100 individuals meets to plan a different reform effort every year, including professional development activities. After the district has identified one area of greatest need a year, based on student and school data, current state or district reform efforts, or plans for textbook adoption, the implementation team meets to plan the reform effort, including professional development. The implementation team includes district staff, teachers, IHE staff, representatives of community organizations, and experts in the field. Once the implementation team develops a draft plan, the team seeks input from various constituent groups, and holds focus groups to fine-tune the plan. With these inputs, the draft plan is completed and disseminated district-wide. The plan, including its professional development component, continues to be a working document, and is modified if necessary as the reform proceeds.

Northtown, Connecticut, takes a different approach that relies on teachers in planning professional development at both the district and school levels. At the district level, there is a professional development committee that consists of two co-chairs, one teacher representative from every building or department, a paraprofessional representative, parents, an assistant superintendent, principals, assistant principals, a special educator, a science coordinator, mathematics coordinator, and Eisenhower coordinator. The committee designs a professional development plan for the district, and revises it based on input from a principal focus group. But in this district, there is a building instructional team that assesses the needs of teachers at each school. The team, which consists of teachers, administrators, parents, and school board members, carries out needs assessments in the school, which includes reviewing test results by grade level, and develops school-specific plans. The principal sets professional development goals for individual teachers, based in part on the analyses of the committee.

Weller, Kentucky, also maintains a balance between district and school levels in planning professional development activities. The district convenes a task force that meets periodically throughout the year to monitor professional development needs and oversee progress. The task force has one representative per school (either a teacher or administrator). In addition, each school develops a consolidated plan that identifies the school's professional development needs, and outlines ways to address them and track progress. The principal and a committee of teachers develop the school plan.

These case findings illustrate how some districts rely on teachers, in different ways, as active participants on committees that shape professional development activities.

MEETING THE NEEDS OF TEACHERS VS. SCHOOLS: THE 80-20 RULE

As our survey and case data indicate, districts vary in their emphasis on planning at the district, cluster, and school levels, and in how they involve teachers in planning. This is a critical issue of implementation to understand, because the Eisenhower legislation's "80-20" rule appears to focus on the importance of planning for Eisenhower-assisted activities by school-level staff. The "80-20" rule states that

> Each local educational agency that receives funds under this part for any fiscal year shall use not less than 80 percent of such funds for professional development of teachers, and, where appropriate, administrators, and, where appropriate, pupil services personnel, parents, and other staff of individual schools in a manner that is determined by such teachers and staff; to the extent practicable, takes place at the individual school site; and is consistent with the local educational agency's application under section 2208, any school plan under part A of title I, and any other plan for professional development carried out with Federal, State, or local funds that emphasizes sustained, ongoing activities (Section 2210(a)(1)(A)(B)(C)).

Our exploratory case studies revealed that there is a lack of clarity about the meaning of this rule (Birman, Reeve, & Sattler, 1998). We found that Eisenhower coordinators are unsure of whether the rule refers to involvement of teachers from multiple schools in planning professional development at the district level, or to involvement of teachers in planning professional development with others in their own schools, or both. Teacher involvement at the district level can help to ensure that topics and learning activities in professional development programs address areas of knowledge and skills that are relevant to teachers district-wide. This can be particularly important for teachers who may be the only ones teaching a particular subject in their school (e.g., physics teachers in small high schools). At the same time, teacher participation in planning at the school level and professional development that takes place at the school allow for more coherent professional development that is closely tied to the needs of teachers in a particular school, and thus potentially more relevant to classroom practice. Some believe that effects on teaching practice are more likely when there is a critical mass of teachers in a school that are all trying to improve their practice in the same way. In Chapter 3, we reported the importance of collective participation to the perceived benefits of the professional development.

Our national survey of Eisenhower coordinators suggests that districts interpret the "80-20" rule in very different ways. Although many district coordinators report that they understand the requirement "very well" (42 percent) or "adequately" (36 percent), they do not all interpret it similarly (data not shown). In our survey, we asked Eisenhower coordinators to explain how they implement the 80-20 requirement in their district, and common responses include the following approaches:

- The district conducts a needs assessment to determine teachers' professional development needs and provides professional development to meet the needs identified.
- At least 80 percent of Eisenhower funds are allocated directly to the school level (in some districts, schools must apply for their share of the funds).
- A committee of teachers and administrators identifies professional development needs in the district and plans activities to meet those needs.
- Most or all Eisenhower-assisted professional development activities must take place at the school site.
- Teachers or schools select professional development based on their own needs, in some cases selecting from a menu of activities provided by the district.

It is clear from this list that districts interpret the 80-20 rule in a variety of ways. Some districts have devolved funding and all decisions about Eisenhower professional development to schools, while other districts have responded by continuing to plan professional development activities at the district level, with a variety of types of teacher input (e.g., through committees, needs assessments, etc.). In some districts, the provision that Eisenhower-assisted activities "be determined by school-level staff" means simply that teachers determine their own professional development activities by selecting activities from a district-determined menu. Finally, some districts apparently interpret the rule to apply to the location of professional development activities themselves. As different as these interpretations are, the Department of Education currently considers all three interpretations to be acceptable.[7]

Other approaches to the 80-20 rule, however, illustrate more confusion about its meaning. In some districts, the rule is interpreted as follows:

- 80 percent of funds support activities in mathematics and science with the remaining 20 percent supporting activities in other subject areas.
- 80 percent of funds are used to pay for professional development activities with the remaining 20 percent used to pay for program administration.

In addition, in several districts, coordinators simply say they do not know how to interpret the rule. Clearly, the current 80-20 provision does not provide clear direction to the nation's school districts. Perhaps one reason that the interpretations of the 80/20 rule are so varied is that it mixes together very different elements—the level of planning for professional development, and the location of the professional development itself. Our case studies illustrate that teacher involvement in planning professional development can be independent from locating professional development at the school, or having staff from the school participate together in professional development activities.

In a number of our case districts, Eisenhower-assisted professional development is planned at the district level, but the district emphasizes approaches to professional development that occurred at the school level. In Commuteville, Virginia, a school-board-appointed committee conducts a needs assessment and makes recommendations for Eisenhower-assisted activities. The committee is composed of teachers, parents, students, administrators, and community representatives. While this planning occurs at the district level, Eisenhower funds support two types of professional development that take place in schools. First, a Colleague Teacher Program attempts to meet the needs of first-year teachers by pairing up new teachers with experienced teachers who offer the new teachers guidance, assistance, and support over the course of a the school year. Second, the district trains promising teachers as "lead teachers" in mathematics and science. These teachers serve as resources and mentors to other teachers in their schools. The district's long-term goal is to have lead teachers for mathematics and science in each school.

In Boonetown, Kentucky, professional development occurs largely at the school, while planning the strategy for professional development is a shared activity of the district Eisenhower coordinator and all of the principals in the district. In Boonetown, resource teachers are assigned to schools, where they work with principals to identify school needs for professional development. The strategy grew out of a number of district-wide committees that recommended reliance on resource teachers. The Eisenhower coordinator brought this idea to a meeting of principals, who arranged to fund the resource teachers with school shares of professional development and instructional funds, in addition to Eisenhower funds. The district Eisenhower coordinator has primary responsibility for planning Eisenhower-assisted professional development, although she relies heavily on all of the district's principals, as a group, in making the plans.

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[7] The Department of Education's Office of the General Counsel communicated its interpretation of the 80-20 rule during the preparation of the first report of this evaluation in September 1997, and again during the review of this report in September 1999.

In contrast to Commuteville and Boonetown, other case districts rely heavily on individual schools to develop plans for professional development activities. In Richmond, New York, each school may apply to the district for a "mini-grant" of $2,000 of the district's Eisenhower funds. But delegating planning to the school level does not necessarily result in professional development activities that are embedded in teachers' daily activities, or even in activities that occur at the school itself. The elementary schools in the district generally use their grants for one-day workshops led by outside consultants. The district's high school, which receives the same amount of funding as the elementary schools, despite its larger enrollment, uses its mini-grant to allow teachers to judge science fairs, attend conferences, and attend "professional development activities of their choice," according to the district Eisenhower coordinator.

Both the literature and Eisenhower legislation support teacher participation in planning professional development activities, and professional development that involves all teachers in a school. The data from our teacher activity survey (reported in Chapter 3 of this report) support the value of teachers participating in professional development activities with others from their schools, departments, or grade. However, our case data illustrate that the level at which planning occurs, and teachers' involvement in it, are not necessarily related to the occurrence of professional development at the school itself, who participates, or the quality of the activities. In other words, planning for professional development at the school level, or occurrence of the professional development activity at the school site, does not necessarily mean that the professional development involves the collective participation of all teachers or groups of teachers at the school.

Summary: Involvement of School Level Staff in Planning for Professional Development

Clearly, the participation of school staff in planning professional development is an important emphasis of the Eisenhower legislation and the professional development literature. Participation in professional development that is embedded in the daily life of teachers at their schools also is emphasized in both the literature and the legislation. Our national data indicate that although teachers are virtually always involved in planning in some way at the district, school, and/or cluster level, teachers participate on a formal basis in committees at about two-thirds of the levels at which planning takes place. Furthermore, while teacher participation in planning professional development may be valuable in communicating what is important to teachers, it appears not to be related to the occurrence of professional development at the school itself.

The intent of the legislation's 80-20 rule is to provide guidance about the involvement of teachers in planning professional development, and the location of professional development activities. However, the legislative language allows for a large variety of interpretations. In open-ended responses, districts demonstrate a large variance in how they interpret the 80-20 rule. On the one hand, this rule could be interpreted as reflecting the perception of both Congress and professional development experts that decisions about professional development are best made at the school level. On another hand, the rule could be interpreted as calling for school-level professional development at the school site.

Thus, while districts seem to be fulfilling the requirements of the legislation by involving teachers in planning and focusing some planning at the school level, the extent to which these actions are actually fulfilling Congress' *intent* is unclear. Most of the interpretations districts have made of the 80-20 rule seem to comply with the law, at least as interpreted by the Department of Education. However, Congress' *intent* in this provision has not been well understood by states or by districts. It is possible that in this provision, the Congress intended to ensure that the needs of teachers, as identified by teachers themselves, were being taken into account in the planning of professional development. If this was the Congress' intent, it seems largely to have been met, though at times without teachers' active participation in a planning process (through participation in formal planning committees).

It is also possible that, in addition to serving individual teachers' needs, the Congress intended that Eisenhower-assisted professional development serve *school* needs in the service of school-wide goals. If this was what the Congress intended, then our data suggest that districts could place more emphasis on school-level planning, and embedding professional development in the daily lives of teachers. Research on professional development suggests that meeting the needs of individual teachers and meeting school-wide needs are both important goals of professional development. The Department of Education and the Congress may want to consider how to make both of these goals clear in the upcoming reauthorization of the Elementary and Secondary Education Act.

DIFFERENCES IN MANAGEMENT AND OPERATION OF EISENHOWER-ASSISTED ACTIVITIES BY DISTRICT POVERTY AND SIZE

Throughout this chapter we report differences in district management and operation according to the district's poverty level and the number of teachers in the district. A synthesis of these results indicates that there is more variation by district size than by poverty level. In general, however, large districts and high-poverty districts perform better on these measures than small districts and low- poverty districts.

Specifically, we find that, compared to low-poverty districts, high-poverty districts:

- co-fund more with NSF and ED programs, and
- employ more continuous improvement efforts.

We find that, compared to small districts, large districts:

- are more aligned with state and district standards and assessments,
- co-fund more with NSF and ED programs, and
- employ more continuous improvement efforts.

Consortia also co-fund and use continuous improvement efforts significantly more than smaller districts do. We also find that both large and small districts have significantly more school-level planning than consortia. Teacher participation in planning is the only element of implementation that does not vary significantly by either district poverty or district size.

These findings, taken together, suggest several conclusions. First, large districts may be more aligned, and, along with consortia, may co-fund more, and use more continuous improvement methods because they have a greater need to integrate professional development with other reforms. Large districts and consortia may have an increased need for organization and integration since they are more likely to have a large number of iniatives and reforms and more money from other federal programs, and because of the larger number of teachers that they serve. This, in turn, would also create the need for more systematic monitoring and evaluation of their professional development (and other reform) efforts. Another reason that they outperform smaller districts on these dimensions may be that larger districts and consortia are likely to have a better infrastructure for coordination among district-level staff who serve in professional development roles.

Similarly, high-poverty districts may co-fund more because they are more likely to have multiple programs operating that share a focus on targeting teachers of special populations of students. Similarly, districts with more students in poverty may conduct more continuous improvement efforts because they are likely to be receiving funds from federal programs that have requirements similar to Eisenhower's for the use of indicators, needs assessments, evaluation, and guidance.

The finding that school-level planning is less common in consortia than in either districts or schools may be because the main purpose of consortia is to foster across-district planning, rather than planning across schools or within individual schools. Single districts that do not have the added issue of across-district coordination may have more latitude to focus planning at the individual school level.

These results show that alignment, co-funding, continuous improvement, and teacher involvement in planning vary across districts. The next section informs our understanding of how these four factors affect the quality of professional development.

THE RELATIONSHIP OF DISTRICT MANAGEMENT TO FEATURES OF PROFESSIONAL DEVELOPMENT

In this chapter so far, we have described several aspects of the district management and operation of Eisenhower-assisted activities. In Chapter 4, we examined the characteristics of district portfolios of professional development. Here, we draw together our results in these two chapters by analyzing the extent to which district management practices are related to particular structural and core features of district Eisenhower professional development portfolios.

As described in Chapter 4, we developed measures of Eisenhower portfolio characteristics. Specifically, they are (1) the percent of the districts' Eisenhower participations in reform activities; (2) the average time span of the districts' activities, both reform and traditional; (3) the extent to which activities have collective participation—participation by whole schools or groups of teachers (e.g., all teachers from the same grade or department); (4) the number of opportunities for active learning offered in in-district workshops or institutes; and (5) the amount of emphasis the district places on targeting professional development activities to teachers of special populations of students (e.g., teachers from Title I schools).

In Chapter 4, we noted that these measures differ by district poverty and size. Here, we take this analysis of portfolio characteristics one step further by presenting a model that describes how the district's role in shaping, implementing, and planning professional development, described earlier in this chapter, is related to the structural and core features of the district's portfolio of activities.

To analyze how the various components of the legislation—those addressing the district's role in design, quality, implementation, and targeting of Eisenhower-assisted professional development activities—are associated with each other, we developed an explanatory model, shown in Exhibit 5.11. This model takes each major component of the legislation, as measured by variables constructed from our survey of Eisenhower coordinators and described in this chapter and Chapter 4, and examines its relationship to several other components.

The model is an implied logic model, in that we hypothesize a sequence of events. Specifically, as Exhibit 5.11 depicts, we assume that districts first build a vision of professional development through alignment and co-funding, then implement and monitor the vision through planning and continuous improvement efforts. These actions then result in particular features of the district portfolio of professional development, such as the percent of teachers in reform types, the average duration of activities, the degree of collective participation, opportunities for active learning, and the district's targeting practices. It should be emphasized, however, that components of the system are likely interactive, and may occur simultaneously. For example, a reform-oriented district may practice superior vision-building and implementation, and design activities with more high-quality components and more targeting, all at the same time, because of the district's orientation toward reform. Our data are not longitudinal, so we cannot test the causal ordering. We can, however, identify the strength of relationships among variables. We suggest a logic of events to help to explain how the process of designing and implementing district-provided development might work; but our model should not be considered to exclude the possibility of two-way effects or an alternative temporal ordering.

We use ordinary least squares regression (OLS) to analyze the paths (or associations) between variables. Only relationships that are significant at the .05 level are reported. Since contextual factors may influence the design and implementation of district portfolios, we have included several district characteristics as control variables in our model: district poverty level, consortium status, the log of the number of teachers,[8] the interaction of the log of the number of teachers and consortium status,[9] and cluster status. (For a detailed description of all of the variables in the model, see Appendix G.)

As Exhibit 5.11 shows, co-funding is the strongest predictor of the features of district portfolios of Eisenhower-assisted professional development. It is related directly to increased targeting (b=.17),[10] a higher percent of teacher participations in reform types of professional development (b=.15), and more collective participation (b=.14), and it is *indirectly* related to more opportunities for active learning and increased targeting through its relationship to increased continuous improvement efforts (b=.16) and more teacher participation in planning (b=.16).

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[8] We expect that the same increase in district size has a smaller effect on implementation and outcome factors as size increases. For example, a 100 teacher increase in district size from 100 to 200 teachers would have more of an effect on implementation and outcome factors than a 100 teacher increase in district size from 1,000 to 1,100 teachers. Taking the log of district size allows measured changes in the dependent variable to be associated with proportional increases in the number of teachers in a district.

[9] The effect of size may differ for consortia and individual districts. Measuring the interaction of the log of district size and consortium status allows us to take this into account.

[10] B represents the standardized beta coefficient, or the standardized regression coefficient, which indicates the strength of the relationship between the two variables. For example, the beta of .17 for the relationship between co-funding and targeting means that for every one standard deviation increase in co-funding, there is a .17 standard deviation increase in targeting. The arrow from co-funding to targeting indicates that targeting was regressed on co-funding.

Coordination in terms of working with schools and professional development providers proved unimportant in our model, but alignment is significantly related to implementation, and structural and core features of professional development. Alignment predicts more participations in reform types of professional development (b=.12), which in turn is associated with a longer span (b=.40), and also more continuous improvement (b=.16). These results support the notion that building a vision of professional development through alignment, and having a critical mass of funds available, made possible through co-funding, are instrumental factors in fostering the provision of high-quality professional development activities. Further, having activities aligned with state and district standards and assessments may indicate that districts are providing guidance and using data for continuous improvement efforts.

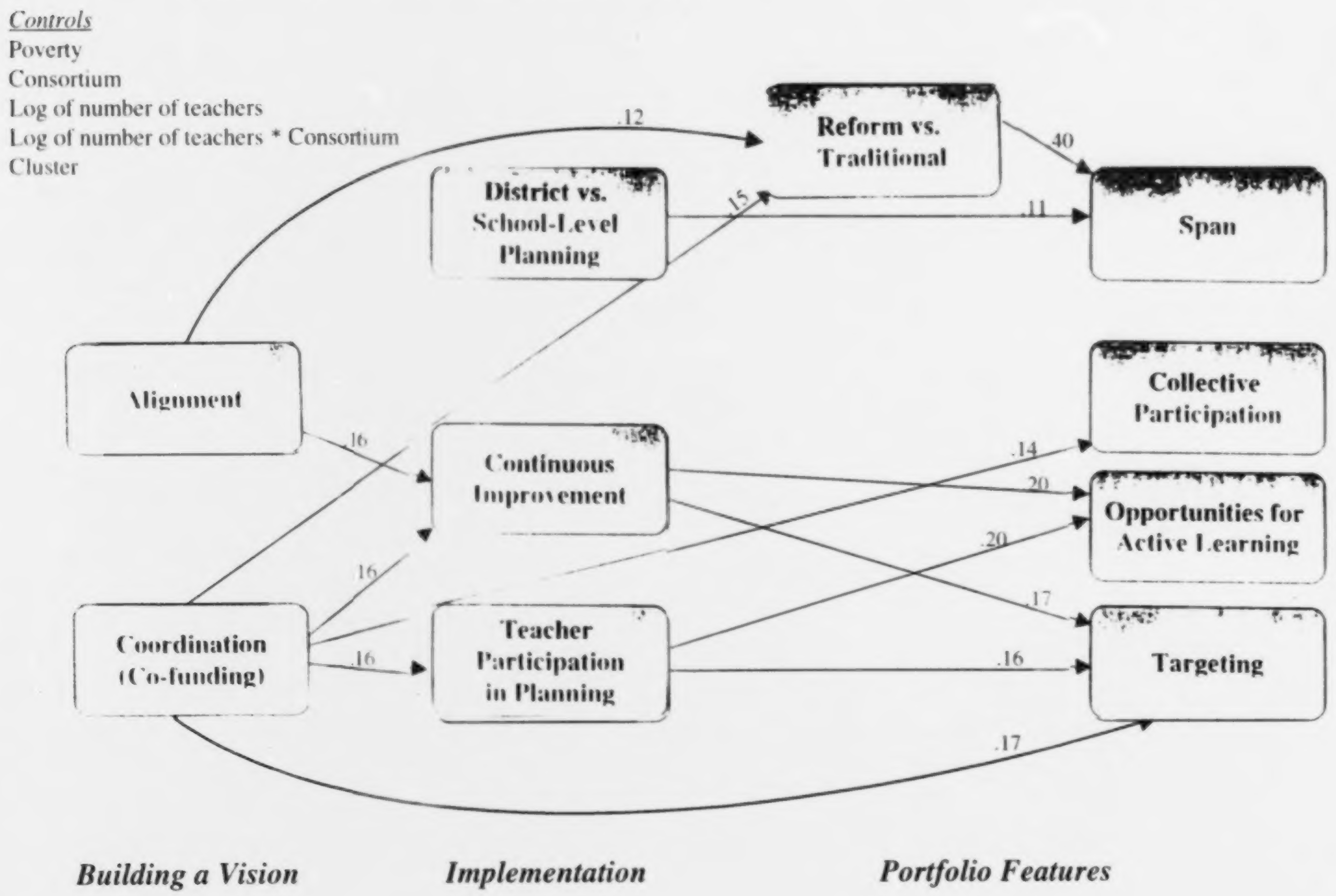
Although this analysis demonstrates the importance of alignment and co-funding, which are emphasized in the Eisenhower legislation, we still do not know as much as we could about the extent to which districts practice alignment and co-funding, or the processes through which they engage in these practices. Developing a deeper understanding of how alignment and co-funding work would help us to understand their link to other implementation efforts, and ultimately, to the provision of high-quality professional development activities.

Continuous improvement is another variable that is associated with outcomes that are emphasized by the legislation, but whose actual operation remains unclear. Continuous improvement efforts, in terms of providing guidance, needs assessments, and evaluation, have a moderate association with both increased opportunities for active learning (b=.20) and increased targeting (b=.17). Our analyses of the sub-scales that comprise continuous improvement, reported earlier in this chapter, show several potentially important findings: 1) districts' use of indicators is not prevalent, and case studies suggest that for those that do use indicators, their use is somewhat perfunctory; 2) evaluative methods do not include linking professional development with teacher actions or student outcomes; and 3) many districts offer particular types of guidance and support to schools and professional development providers, but offer little guidance related to the use of data. This indicates that while districts play a role in guiding schools and professional development providers, districts may lack the capacity for sophisticated use of data in decision-making, planning, and evaluation.

In terms of planning, Exhibit 5.11 shows that district-level planning (as opposed to school-level planning) is related to activities of longer span (b=.11), and teacher participation in planning is related to activities with more opportunities for active learning (b=.20) and more targeting of teachers of special populations of students (b=.16). These relationships support our findings reported earlier in this chapter. High-quality professional development can be planned at any level, and planning at the district level is not the same as implementation at the district level. As our case studies show, there are examples of both high-quality professional development planned at the district level and low-quality professional development planned at the school level. This reinforces the need to clarify the 80-20 rule, to determine Congress' intent in encouraging school-level planning and implementation of professional development activities.

EXHIBIT 5.11

Relationship of District Management to Features of Professional Development



Controls
Poverty
Consortium
Log of number of teachers
Log of number of teachers * Consortium
Cluster
Alignment
Coordination (Co-funding)
District vs. School-Level Planning
Continuous Improvement
Teacher Participation in Planning
Reform vs. Traditional
Span
Collective Participation
Opportunities for Active Learning
Targeting
.12
.15
.40
.11
.16
.16
.16
.14
.20
.20
.17
.16
.17
Building a Vision
Implementation
Portfolio Features

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SUMMARY AND CONCLUSIONS

In this chapter, we described how districts manage and operate Eisenhower-assisted professional development activities. We examined how districts build a vision for professional development through alignment and coordination, and how they implement that vision, through continuous improvement efforts and through planning at different levels with different types of teacher involvement. We also examined how these management practices and operations differ in districts of different poverty levels and sizes, and we present a model of how these practices shape the quality of Eisenhower-assisted professional development activities. Several of the findings of these analyses have important implications for the Eisenhower Professional Development Program.

First, districts are much more likely to have their professional development aligned with standards than with assessments. This suggests that many districts may not yet have their assessments aligned with district and/or state standards. If one major goal of the Eisenhower legislation is to fit professional development into the framework of other reforms in the district, it may be that districts have considerable work to do to establish connections and alignment across standards and assessments before this is possible.

Second, we find that co-funding plays an important role in the implementation, management, structure, and core features of Eisenhower-assisted professional development. Our data show that co-funding most often occurs with other programs focused on mathematics and science, and that other types of coordination can be less substantive and meaningful in shaping professional development. This highlights the importance of having subject-area focus in common in order to promote co-funding. Also, gaining a more comprehensive understanding of the dynamics involved in combining funding streams with other programs would help us focus on how this process results in districts being better able to provide professional development that meets the high standards of quality outlined in the provisions of the Eisenhower legislation.

Third, continuous improvement efforts are related to certain portfolio features, such as greater opportunities for active learning and targeting, but these efforts are relatively rare. Eisenhower coordinators are least likely to report using data-driven continuous improvement methods, such as applying indicators to professional development or linking teacher practices with student achievement to evaluate professional development activities. Perhaps more emphasis on these important and more rigorous methods of continuous improvement would increase the quality of these efforts, and as a result, improve the quality of the professional development activities that districts provide.

Lastly, our analyses of differences according to district poverty level and district size suggest that there are certain advantages that large districts have over small districts, and that high-poverty districts have over low-poverty districts, in shaping, planning, and implementing Eisenhower-assisted professional development activities. It is likely that the presence of more federal dollars, more staff (and thus more need to coordinate), and better infrastructure for communication and coordination all contribute to these differences. Learning more about the conditions that facilitate better implementation and planning in certain types of districts would help to identify possible added supports that some districts need; it may also suggest particular conditions or processes that could be established or required by the Eisenhower legislation in order to develop capacity in other districts.

CHAPTER 6

STATE AGENCY FOR HIGHER EDUCATION GRANTEES: FEATURES AND MANAGEMENT OF EISENHOWER-ASSISTED ACTIVITIES IN INSTITUTIONS OF HIGHER EDUCATION AND NONPROFIT ORGANIZATIONS

The Eisenhower legislation includes a component of the program for professional development projects sponsored by state agencies for higher education (SAHEs). This component of the Eisenhower program operates separately from the component that supports district-sponsored activities. The legislation allocates 16 percent of Eisenhower funding for the SAHE component of the Eisenhower program. Unlike the remaining 84 percent of Eisenhower funding, which is distributed by a formula through State Educational Agencies (SEAs) to local educational agencies (LEAs), SAHEs sponsor competitions within their states and make awards to organizations that apply. Grants are awarded primarily to institutions of higher education (IHEs), such as colleges and research universities, and nonprofit organizations (NPOs), such as museums and libraries. In sponsoring these competitions, each SAHE develops priorities and establishes criteria for awarding the grants. The priorities, guidelines, and criteria are based to some extent on the state plan to improve teaching and learning, which the legislation requires the SEA to develop in conjunction with the SAHE, as part of the application process. In the plan, SEAs and SAHEs describe the process and results of their assessment of the needs of their teaching force, and how the activities that the state intends to provide will address teachers' needs, including recruitment, pre-service and induction and continuing through the provision of in-service activities, as well as how the professional development plan incorporates standards and indicators and provides for the needs of teachers of special populations of students.

The SAHE component of the Eisenhower program takes advantage of the prominent role of IHEs in preparing the nation's teachers. This component is designed to encourage IHEs and NPOs to provide high-quality in-service and pre-service professional development that is consistent with state standards and reforms, and to foster closer ties between higher education institutions and elementary and secondary education agencies.

SAHE-sponsored IHE/NPO Eisenhower projects (referred to as "SAHE grantees") are subject to the same stipulations regarding quality that apply to district activities—requirements for activities to be in core subject areas, mainly in mathematics and science, but also including other core academic subject areas, and to be sustained, intensive, and innovative. Specifically, the legislation says that the grants, contracts, and/or cooperative agreements established with the SAHE grantee shall be for

> Professional development activities in the core academic subjects that contribute to the State plan for professional development (Section 2211(a)(1)(A)); developing and providing assistance to local educational agencies, and the teachers and staff of each such agency, for sustained high-quality professional development activities (Section 2211(a)(1)(B)); and improving teacher education programs in order to promote further innovation in teacher

> education programs within an institution of higher education and to better meet the needs of the local educational agencies for well-prepared teachers (Section 2211(a)(1)(C)).

The law also describes several types of activities that SAHE grantees are to provide, including

> Sustained and intensive high-quality professional development for teams of teachers, or teachers, and, where appropriate, pupil services personnel and administrators from individual schools or school districts (Section 2211(b)(1)); other sustained and intensive professional development activities related to achievement of the State plan for professional development (Section 2211(b)(2)); and pre-service training activities (Section 2211(b)(3)).

The SAHE portion of the law also includes specific coordination requirements for grantees, namely, that they "work in conjunction with a local educational agency" (Section 2211)(a)(1)) by "entering into an agreement with an LEA to provide sustained, high-quality professional development" (Section 2211(3)).

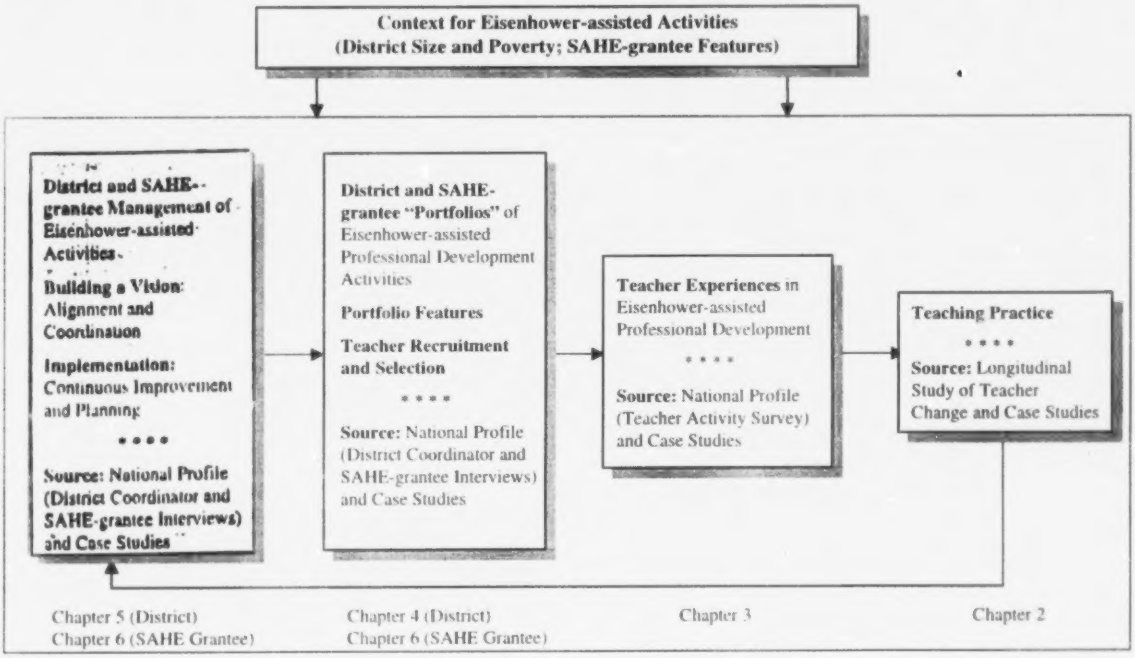
In addition to these specific requirements that define the quality of SAHE-sponsored professional development, SAHE grantees must be responsive to the general purposes of the Eisenhower Professional Development Program, as identified in the legislation. SAHE grantees should provide professional development that, for example, "includes strong academic content and pedagogical components" (Section 2002(2)(C)); "is of sufficient intensity and duration" (Section 2002(2)(E)); and "creates an orientation toward continuous improvement throughout the school" (Section 2002(2)(F)).

Similarly, the law's general goals for providing professional development to teachers of students of diverse needs apply to SAHE grantees. These provisions stipulate that professional development provided under the Eisenhower program should "incorporate effective strategies" to meet the needs of teachers of "diverse student populations" (Section 2002(2)(D)). SAHE grantees also are subject to the general provisions of the law that state that professional development offered under the Eisenhower program should be "tied to challenging State content standards and challenging State student performance standards" (Section 2002(2)(A)).

SAHEs are responsible for designing competitions and awarding grants to IHE/NPO professional development projects that meet the criteria outlined in the legislation. In this chapter, we describe the extent to which SAHE grantees meet the requirements of the legislation. We provide information about the SAHE-grantee characteristics and practices that shape their activities: the structural and core features of professional development activities; recruitment and targeting of teachers of special populations of students; alignment with state and district standards and assessments and coordination with districts; and the use of continuous improvement mechanisms, such as indicators, needs assessments, and evaluation. Exhibit 6.0 illustrates how this chapter fits into the conceptual framework of the entire study.

EXHIBIT 6.0

Conceptual Framework for This Evaluation


Context for Eisenhower-assisted Activities
(District Size and Poverty; SAHE-grantee Features)
District and SAHE-grantee Management of Eisenhower-assisted Activities
Building a Vision: Alignment and Coordination
Implementation: Continuous Improvement and Planning
• • • •
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
District and SAHE-grantee "Portfolios" of Eisenhower-assisted Professional Development Activities
Portfolio Features
Teacher Recruitment and Selection
• • • •
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
Teacher Experiences in Eisenhower-assisted Professional Development
• • • •
Source: National Profile (Teacher Activity Survey) and Case Studies
Teaching Practice
• • • •
Source: Longitudinal Study of Teacher Change and Case Studies
Chapter 5 (District)
Chapter 6 (SAHE Grantee)
Chapter 4 (District)
Chapter 6 (SAHE Grantee)
Chapter 3
Chapter 2

Data Sources

In this chapter, we use our survey data from SAHE-grantee project directors. During the spring of 1998, we conducted telephone interviews with a nationally representative sample of 92 SAHE grantee project directors. This represents a response rate of 87 percent. To develop the sampling frame, we contacted all 50 SAHE Eisenhower coordinators and obtained complete lists of projects supported during the 1997-98 school year. We sampled SAHE grantees in proportion to the size of their Eisenhower grant, based on the assumption that the number of teachers served was proportional to the size of the grant. After collecting information on the number of teachers who participated in SAHE-grantee activities, we weighted the data according to the number of teachers actually served by the SAHE grantees.[1] As a result, our data are representative of all teachers participating in SAHE-grantee projects.[2]

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[1] The correlation between grant size and the number of teachers served is .6. All parameter estimates reported in the chapter are weighted. Reported p-values and the standard errors on which they are based, however, do not reflect the variance in weights across SAHE grantees. Analyses that take this element of the complex sample design into account have been carried out, and the results are nearly identical to those reported in the chapter.

[2] Throughout the chapter, we refer to the *percent of teachers in SAHE-grantee projects;* but our data actually represent the percent of teacher *participations* in SAHE-grantee projects. These two figures differ based on the extent to which the same teacher participated in more than one SAHE-grantee activity. For clarity of presentation, and because multiple participations in IHE/NPO activities are minimal, we present our findings in terms of *percent of teachers.*

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We asked the project directors questions that referred to the time period from July 1 through December 31, 1997 (the same time period for which district coordinators answered questions, as reported in Chapters 4 and 5 of this report). All data presented in this chapter refer to that time period, unless otherwise noted. SAHE grantees can use Eisenhower funding to support one activity, or several activities. On our survey, a single activity is defined as an event with a common group of participants.[3] Some questions on the survey apply to all SAHE-grantee activities, and some questions apply only to the grantee's "primary" activity.[4] For questions that pertained to characteristics of activities, such as structural and core features, we asked SAHE-grantee project directors about the primary professional development activity that they support with Eisenhower funds. Questions that refer to general practices, such as targeting and coordination, apply to all of the grantee's Eisenhower-assisted activities. The exhibits in this chapter indicate when the data apply only to the IHE/NPO's primary activity; otherwise, the data report on general practices that apply to all of the SAHE grantee's Eisenhower-assisted activities.[5] While a SAHE can play a key role in shaping its grantees' projects through the guidelines and criteria it establishes for the grants competition, in this chapter we focus primarily on the quality and operation of the grantees' Eisenhower project.[6]

We use our case studies of SAHE grantees to explain and describe particular aspects of professional development structure, substance, and organization. In the spring and summer of 1998, we conducted open-ended telephone interviews with project directors at six IHEs that served teachers in our case-study districts. We conducted in-depth interviews with the directors, and collected their Eisenhower grant proposals, and descriptions of the Eisenhower activities that they provided.

The data reported in this chapter refer to Eisenhower-assisted *in-service* activities that are provided by SAHE grantees. Most SAHE grantees conduct pre-service as well as in-service professional development activities, and Eisenhower funds can be used for either purpose. We focus in this report on in-service activities, since nearly all of SAHE-grantees use Eisenhower funds for this purpose.[7] Also, while districts sometimes may use IHE/NPOs to supply Eisenhower-assisted professional development activities, this chapter describes only the IHE/NPO professional development activities that SAHEs administer through the Eisenhower Professional Development Program.

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[3] For example, if four different groups of teachers attended the same workshop on four separate occasions, this would count as four activities. But if one group of teachers attended a workshop and a follow-up event, this would count as one activity.

[4] If SAHE-grantee project directors provided more than one Eisenhower-assisted activity, we asked them to identify one as their primary activity.

[5] Since our survey asked SAHE grantees to describe characteristics of their *primary* activity, and our district survey asked district coordinators to describe characteristics across *all* activities, comparisons of responses to these questions are inappropriate. However, questions about targeting, alignment, coordination, and continuous improvement efforts refer to the activities of both SAHE grantees and districts overall; therefore, we are able to compare these responses, and, where such comparisons seem instructive, we do so.

[6] Due to the small number of grantees, SAHEs may be able to monitor their grantees' projects to help ensure faithful implementation; but we did not examine the SAHE's monitoring role.

[7] In 1992-1993, 1993-1994, and 1994-1995, the average percent of Eisenhower funds that State Agencies of Higher Education (SAHEs) used for pre-service activities was 3 percent in each year (Donly & Gutman, 1997); for 1996-1997, SAHEs reported that 14 percent of Eisenhower funds were used to support pre-service professional development (Celebuski et al., 1998).

Organization of Chapter

We begin the chapter by describing the characteristics of the SAHE grantees in our national sample. We then provide data about the subject-area and structural features of the primary professional development activities provided by our sample of SAHE grantees. The structural features are type of activity (traditional vs. reform); duration, including both contact hours and span across days, weeks, months, or years; and collective participation (i.e., the extent to which activities are designed for groups of teachers or whole schools).

The next section reports findings on core features of activities, specifically the strength of the content focus of the activity and the number of active learning opportunities provided in the activity. Next, we focus on the targeting and recruitment of teachers of special populations of students. Here we examine how frequently SAHE grantees target teachers of special populations of students, how teachers come to participate in SAHE-grantee projects, and strategies that SAHE grantees use to increase teacher participation.

After the targeting section, we analyze the extent to which SAHE grantees' projects are aligned with state and district standards and assessments and coordinated with districts. We then report on the continuous improvement efforts of SAHE grantees—whether they use state and district indicators in designing professional development, and whether and how they conduct needs assessments and evaluate their projects.

The continuous improvement section is followed by a summary and analysis of findings concerning significant differences on key variables according to type of institution and departmental affiliation. Throughout the chapter, we report findings according to the type of institution in which the Eisenhower project director works, and the department with which the project director is affiliated because these factors may shape the structure and substance of professional development activities in systematic ways. We distinguish two types of institutions—research universities and universities that grant doctorates; and all other types of colleges and universities (e.g., two-year colleges, private liberal arts colleges, and institutions that grant only bachelor's or master's degrees). We distinguish three departmental affiliations—mathematics or science departments; education departments; and "other" departments (e.g., administrative, media, or broadcasting). NPOs are excluded from comparisons of institution type and departmental affiliation, since these characteristics do not apply to them. Otherwise, all analyses combine data from SAHE-supported IHEs and NPOs.

The potential significance of these departmental affiliation distinctions is highlighted in the legislation, which defines another joint effort that is required of IHEs—between the IHE's school of education and the discipline in which the professional development is being provided. The law states that

> Each activity assisted under this section, where applicable, shall involve the joint effort of the institution of higher education's school or department of education, if any, and the schools or departments in the specific disciplines in which such professional development will be provided (Section 2211(A)(4)).

The variation in project directors' educational training and pedagogical practices across disciplines and in different types of IHEs may play a role in shaping the professional development activities that the project director develops and provides. To examine whether or not the structural and core features and implementation of professional development differs according to the type of

IHE or the departmental affiliation of the project director, we include both of these factors when we analyze the main variables in our study (i.e., participations in traditional vs. reform activities, duration, span, collective participation, active learning opportunities, content focus, targeting, alignment, coordination, and continuous improvement). Although a project that is housed in a particular department may be administered collaboratively by the school of education and the college or school in which the mathematics/science department resides, our study focuses on the departmental affiliation of the project director. Both factors are included in all analyses we present; therefore institution type effects are independent of affiliation effects, and affiliation effects are independent of the effects of institution type. Further, whenever we test for significant differences according to institution type and departmental affiliation, we test for interaction effects, and report where these are significant.

After the summary analysis of results by institution type and departmental affiliation, we discuss a path model that shows the relationships among many of the variables in the chapter, and we suggest how they may work together to foster high-quality professional development. The last section of the chapter highlights the major findings and suggests implications for both the legislation and practice.

CHARACTERISTICS OF IHE/NPO RECIPIENTS OF EISENHOWER GRANTS

Section Findings

- *A little less than half of the teachers participating in SAHE-grantee projects are in projects in research or doctoral-granting universities. A little more than half are in projects in other types of institutions—those that grant bachelor's and master's degrees only, private liberal arts institutions, and public two-year colleges.*

- *Nearly half of the participating teachers are in IHEs whose Eisenhower projects are affiliated with mathematics or science departments, but almost as many are in IHEs whose Eisenhower projects are affiliated with education departments. The majority of participating teachers are in projects whose Eisenhower projects are headed by tenured professors, and almost two-thirds are in projects that have received Eisenhower support for four years or more.*

- *Approximately one-third of the participating teachers are in projects that provide one or two activities, one-third are in projects that provide three to ten activities, and one-third are in projects that provide more than 10 activities. A little less than half of the participating teachers are in projects that provide only one or two* types *of activities.*

Eighty-six of our total sample of project directors are from IHEs; six are from NPOs. To develop a detailed view of the characteristics of SAHE grants in IHEs, we asked a series of questions of each project director about the type of college or university the director works in, and the department, school, or center with which the director is affiliated. We also asked each director to describe his or her position (e.g., tenured professor, adjunct professor).

As Exhibit 6.1 shows, results from our survey of SAHE-sponsored IHE Eisenhower project directors indicate that about a third (34 percent) of teachers participating in IHE Eisenhower-assisted activities are in IHEs that offer only bachelor's or master's degrees, about two-fifths (44 percent) of participating teachers are in IHEs at either research or doctoral-granting universities, and less than a quarter (22 percent) are in private liberal arts and public two-year universities.[8]

EXHIBIT 6.1

Characteristics of SAHE Grantees

	IHEs (percent of teachers participating in SAHE-sponsored IHE projects, by IHE characteristics) (n=86)	NPOs (number) (n=6)
IHE Institution Type		
Research	16	
Doctoral	28	
Bachelor's/Master's–Granting	34	
Private Liberal Arts	10	
Public Two Year	12	
NPO Institution Type		
Professional Association		1
Media Organization		2
Consortium of City School Divisions		1
Environmental Organization		1
Educational Institutions		1
Number of Years Receiving Eisenhower Support		
Less than 1 year	1	1
1 year	8	0
Between 1–3 years	29	3
Between 4–5 years	10	2
More than 5 years	48	0
Departmental Affiliation of Principal Investigator		
Mathematics	23	
Science	24	
Education	39	
Other	13	
Position of Principal Investigator		
Tenured Professor	56	
Adjunct Professor	1	
Dean or Department Head	17	
Research Center Staff	7	
Other	20	

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[8] As a result of rounding, percents may not sum to 100 percent.

Each IHE project director also reported the department, school, or center with which he or she is affiliated. As Exhibit 6.1 shows, more than a third (39 percent) of teachers participating in SAHE-sponsored IHE projects are in projects affiliated with the education school or department; 24 and 23 percent are in projects affiliated with the science and mathematics department, respectively; and 13 percent are in projects affiliated with other departments or schools. Examples of other departments or schools that project directors are affiliated with are departments of broadcasting services, general studies, language and literature, and parallel studies; a college of business; a group of academic administrators; and a university outreach organization.

Each project director also indicated which position he or she held. Exhibit 6.1 shows that the majority of participating teachers (56 percent) are in projects whose directors report being tenured professors; 17 percent are in projects whose directors are deans or department heads (who, in most cases, also is a tenured professor); seven percent are in projects whose directors are part of the staff of a research center; and only one percent are in projects whose directors report being adjunct professors. The remaining 20 percent of participating teachers are in projects whose directors report holding positions other than one of these four, but do not describe the position.

We also asked IHE project directors how long they have been receiving Eisenhower funds, not limited to the project we asked them about on the survey. As Exhibit 6.1 shows, nearly half (48 percent) of the participating teachers are in projects that have received Eisenhower support for more than five years; ten percent are in projects that have received support from the Eisenhower program for between four and five years; and 29 percent are in projects that have received Eisenhower grants for between one and three years. Eight percent of participating teachers are in projects that have received Eisenhower funds for less than one year, and only one percent are in projects that have received Eisenhower support for less than a year.

The NPOs in our sample represent several different types of organizations. As indicated in Exhibit 6.1, one NPO is a professional association, two are media organizations, one is a consortium of several city school divisions, one is a private nonprofit environmental organization, and one is a regional nonprofit educational institution. Three of the NPOs have received money from the Eisenhower program for between one and three years, two have received Eisenhower funds for between four and five years, and one of the NPOs in our study has received Eisenhower funds for less than one year.

To get a sense of the types and scope of activities that SAHE grantees provide, we asked project directors to describe the types of activities that they provide (e.g., workshops, conferences, courses, networks, and internships), the number of activities that they provide each year, and how many teachers are served by each activity (data not shown). Their responses indicate that SAHE-grantees vary in the number of activities that they provide. Almost a third of participating teachers are in SAHE-grantee projects that provide only one or two activities per year: specifically, 21 percent of participating teachers are in projects that provide only one activity, and 10 percent are in projects that provide two activities. Seventeen percent of participating teachers are in projects that provide three to five activities, 16 percent are in projects that provide six to ten activities, 16 percent are in projects that provide 11 to 15 activities, and 21 percent are in projects that provide 16 or more activities. Similarly, some SAHE grantees support only a few types of activities while others support several types. Thirty-nine percent of participating teachers are in projects that support only one type of activity, eight percent are in projects that support two types, four percent are in projects that support three types, 21 percent are in projects that support four types, and 29 percent are in projects that support five or more types of activities.

The median number of teachers that SAHE grantees serve is 33 teachers (data not shown).[9] More specifically, 31 percent of participating teachers are in SAHE-grantee projects that serve 25 teachers or fewer, 29 percent are in projects that serve 26 to 50 teachers, 13 percent are in projects that serve 51 to 100 teachers, 10 percent are in projects that serve 101 to 200 teachers, nine percent are in projects that serve 200 to 500 teachers, and three percent are in projects that serve more than 500 teachers.

These results indicate that, on average, professional development sponsored by SAHEs are projects in IHEs; are housed in education, mathematics, or science departments; are in institutions most likely to grant teaching degrees; directed by tenured professors who themselves or whose institutions have a history of several years of working with the Eisenhower program; and are focused on a few types of activities for a small number of teachers. This contrasts with the professional development provided by districts, as reported in Chapters 4 and 5; districts tend to provide portfolios of a diverse set of activities, while SAHE grantees typically support one focused, small-scale project. We now move on to discuss the structural characteristics of the professional development activities that SAHE grantees provide.

STRUCTURAL FEATURES OF SAHE-GRANTEE-PROVIDED PROFESSIONAL DEVELOPMENT

Section Findings

- *SAHE grantees use Eisenhower funds to support activities mainly in mathematics and science, but more than a third of teachers who participate in SAHE-sponsored projects are in projects that also use Eisenhower money to support activities in other subject areas.*

- *Over 80 percent of participating teachers are in SAHE-sponsored projects where the primary Eisenhower-assisted activity is a traditional type (e.g., workshops and courses); only 15 percent of participating teachers are in projects where the primary activity is of a reform type (e.g., study groups, teacher networking and mentoring).*

- *Most SAHE grantees' primary activities are of long duration—they last more than 40 hours and span from one month to a year; however, a small portion last less than nine hours and span less than one month.*

- *Most SAHE grantees' primary activities projects do not serve all teachers in a grade, department, or a whole school (i.e., collective participation).*

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[9] Information about the number of teachers served by the SAHE grantees is an approximation. We had two sources of information about the number of teachers served — data from professional development activity lists that we collected from SAHE-grantee project directors and data from our telephone surveys with SAHE-grantee project directors. In many cases, these data did not match exactly. We averaged the two sources of data together and used this number as our estimate of the number of teachers served by each SAHE-sponsored IHE or NPO project.

- *IHE projects housed in education departments, compared to mathematics/science departments, have significantly more reform types of activities, and have activities of significantly longer duration, both in number of contact hours and span of time. Research/doctoral universities sponsor Eisenhower professional development activities with significantly more collective participation than other types of colleges and universities.*

The substance of activities depend to a large extent on the structure of the activity—specifically, the type of activity, its duration, and the groups of teachers who participate. The legislation recognizes the importance of these features of professional development. Although the legislation does not specify the particular type of professional development that SAHE grantees should provide, the law draws on research that says that "new and innovative strategies for teaching to high standards will require time for teachers, outside of the time spent teaching, for instruction, practice, and collegial collaboration" (Section 2001(4)(D)). There are specific requirements in the law that SAHE-sponsored IHE/NPOs provide professional development that is "sustained and intensive" (Section 2211(b)(1) and (2)). In addition, SAHE grantees are expected to fulfill the more general purposes of the law, which call for professional development that "is of sufficient intensity and duration to have a positive and lasting impact on the teacher's performance in the classroom" (Section 2002(2)(E)). Also, the SAHE portion of the law says that professional development may be designed for "teams of teachers" (Section 2211(b)(1)), among other groups. This is consistent with the part of the law focused on districts, which emphasizes the importance of school-level participation, and encourages that the professional development "take[s] place at the individual school site" (Section 2210(a)(1)(B)).

Although there is limited research on the relationship between features of professional development and teacher or student outcomes, the evidence that is available supports the law's emphasis on type, duration, and collective participation. The literature suggests that traditional methods of professional development, such as workshops, are not likely to extend over long periods of time and offer teachers opportunities for in-depth study to practice what they have learned, and to collaborate and provide feedback to each other (Little, 1993). Also, since these traditional approaches are less likely to afford teachers the opportunity for reflection on what they have learned and for in-depth engagement, these types of activities are thought to be not as likely to elicit the desired changes in knowledge, skills, and teaching practice (Darling-Hammond, 1997a; Sparks & Loucks-Horsley, 1989).

Further, proponents of systemic reform maintain that teachers who teach the same grade or subject area should be operating from the same subject base, and from similar approaches to teaching and learning. Researchers suggest that professional development that is designed for whole schools or groups of teachers from schools (defined as "collective participation" in this report) provide teachers with a community of learners, as well as the capacity to share knowledge and to learn from each other, and to develop and implement strategies to serve the specific needs of their students (Ball, 1996; Little, 1993; Newmann et al., 1996).

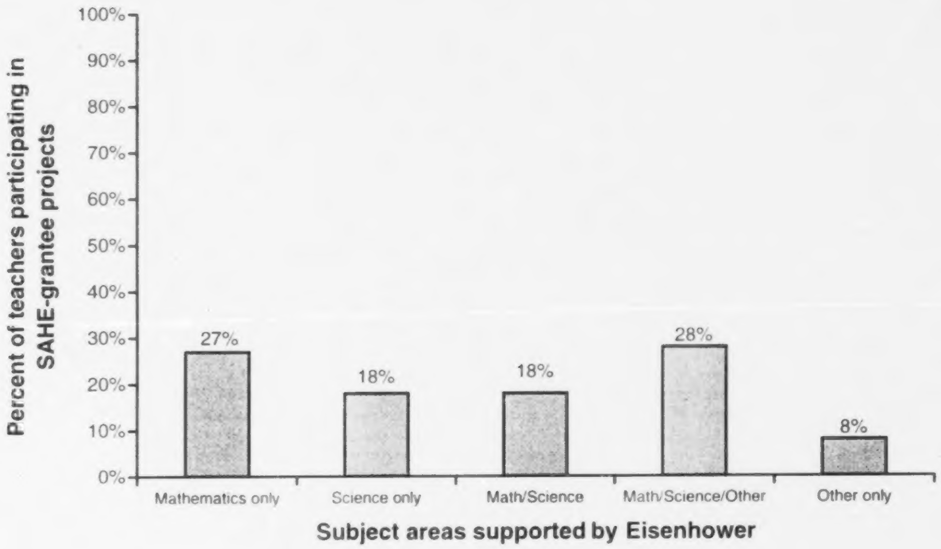
In this section, we report the findings from our SAHE-grantee survey that describe the three structural features—type, duration, and collective participation—which are emphasized in both the Eisenhower legislation and the professional development literature.

Subject Areas of Primary Activity

We asked each SAHE-grantee project director to list the subject areas covered in the project's primary activity, including mathematics, science and other subject areas.[10] As Exhibit 6.2 shows, the majority of teachers participating in SAHE-grantee projects are in projects whose primary Eisenhower-assisted activity includes mathematics only (27 percent), science only (18 percent), or a combination of mathematics and science (18 percent). Twenty-eight percent of participating teachers are in projects whose primary activity includes a combination of mathematics, science and other subject areas, and eight percent of teachers are in projects whose primary activity does not include mathematics and science.

EXHIBIT 6.2

Percent of Teachers Participating in SAHE-grantee Projects with Primary Activities That Cover Mathematics, Science, and Other Subject Areas (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 27 percent of teachers participating in SAHE-grantee projects are in projects whose primary Eisenhower-assisted activity is in mathematics only. Each bar and the number on top of it represent the percent of participating teachers for each category.

Type of Activity

To examine the extent to which SAHE grantees provide traditional vs. reform activities, we asked SAHE-grantee project directors to classify their primary activity using our list of traditional and reform types of professional development. All types of workshops and courses are categorized as traditional, and the seven other types of activities are categorized as reform: study groups, teacher networking, mentoring, committees or task forces, internships, individual research project, and teacher resource centers.

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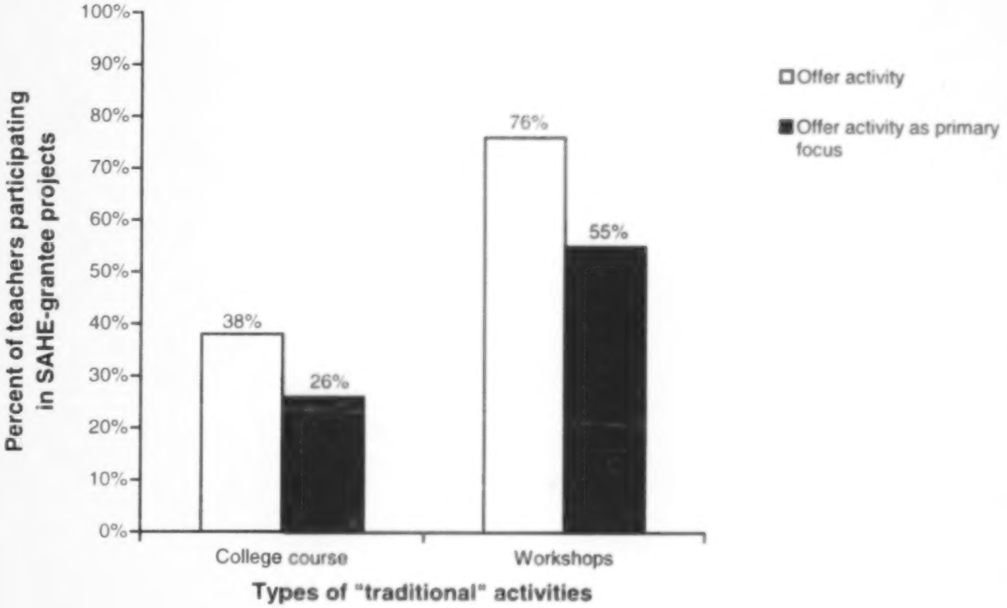
[10] Our sampling plan required that selected SAHE-grantee projects offer activities in mathematics and/or science.

Results, shown in Exhibit 6.3, indicate that about three-quarters (76 percent) of participating teachers are in projects that support workshops, and 55 percent are in projects that support workshops as their primary activity. Similarly, 38 percent are in projects that offer college courses, and 26 percent are in projects that offer college courses as their primary activity.

EXHIBIT 6.3

Percent of Teachers Participating in SAHE-grantee Projects That Offer "Traditional" Activities (n=92)



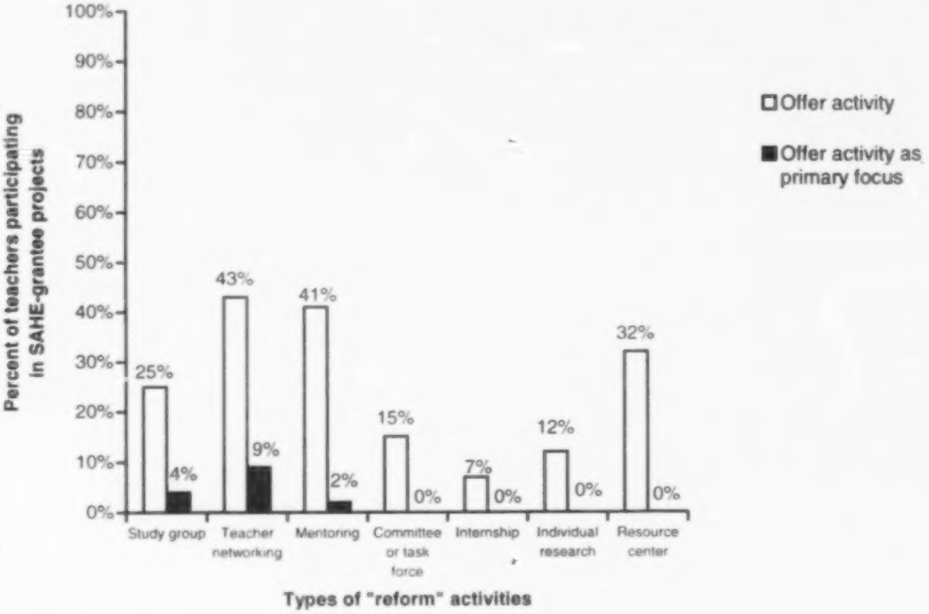
Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 38 percent of teachers participating in SAHE-grantee projects are in projects that use Eisenhower funds to offer college courses. The second bar shows that 26 percent of participating teachers are in projects whose primary Eisenhower-assisted activity is a college course. Each bar and the number on top of it represent the percent of participating teachers for each category.

Exhibit 6.4 shows the percent of participating teachers in projects that support each of the seven reform types of professional development. Between a third and a half of participating teachers are in projects that use Eisenhower funds to support teacher networks (43 percent), mentoring (41 percent), and resource centers (32 percent). Twenty-five percent are in projects that use Eisenhower funds for study groups, and 15 percent are in projects that use Eisenhower funds for committees or task forces. Less than 20 percent are in projects that use money from the Eisenhower program to fund either internships or individual research projects.

These reform activities are rarely a SAHE grantee's primary activity. Only nine percent of participating teachers are in projects that support teaching networks as their primary activity, four percent are in projects that support study groups as their primary activity, and two percent are in projects that support mentoring as their primary activity. No SAHE grantees use Eisenhower to support committees or task forces, internships, individual research projects, or teacher resource centers as their primary activity.

EXHIBIT 6.4

Percent of Teachers Participating in SAHE-grantee Projects That Offer "Reform" Activities (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 25 percent of teachers participating in SAHE-grantee projects are in projects that use the Eisenhower program to fund study groups. The second bar shows that 4 percent of participating teachers are in projects whose primary activity is a study group. Each bar and the number on top of it represent the percent of participating teachers for each category.

Among SAHE grantees that are IHEs, we examined whether the choice of supporting a reform versus traditional activity as the primary activity differs by type of institution or departmental affiliation.[11] Exhibit 6.5 shows that there are no significant differences by institution type, but education departments and "other" departments are significantly more likely than mathematics/science departments to have a reform activity as their primary activity. The difference may be due to the fact that professors in education and "other" departments are more likely to be social scientists, or curriculum and instruction specialists than are mathematics or science professors.

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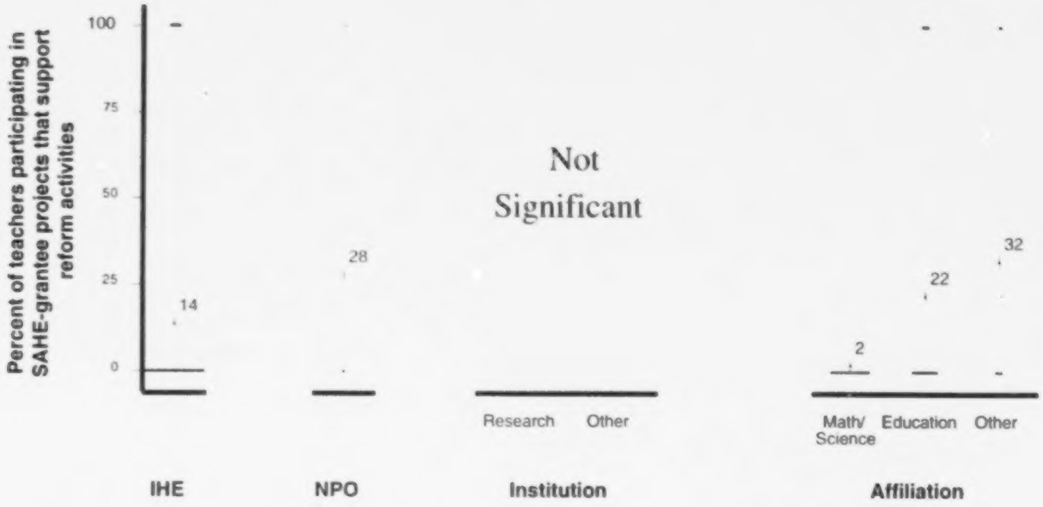
[11] The distribution and mean for IHEs and NPOs are presented separately in these analyses, but we did not test for significant differences between IHEs and NPOs because of the small number of NPOs in our sample.

As a result, professors in education or "other" departments may be more knowledgeable about alternative formats for structuring activities, other than traditional courses or workshops.

EXHIBIT 6.5

SAHE-grantees' Support for "Reform" Types of Activities, Overall and by Institution Type and Departmental Affiliation (n=92)



	Significant Pairwise Contrasts
Departmental Affiliation	Mathematics/Science vs. Education; Mathematics/Science vs. Other

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to Read: The first distribution shows that on average, 14 percent of teachers participating in SAHE-grantee projects are in projects whose primary Eisenhower-assisted activity is a reform activity. Support for reform activities differs significantly by departmental affiliation, but not by institution type. Each dot represents one IHE/NPO project. As the number of IHE/NPO projects at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

Duration

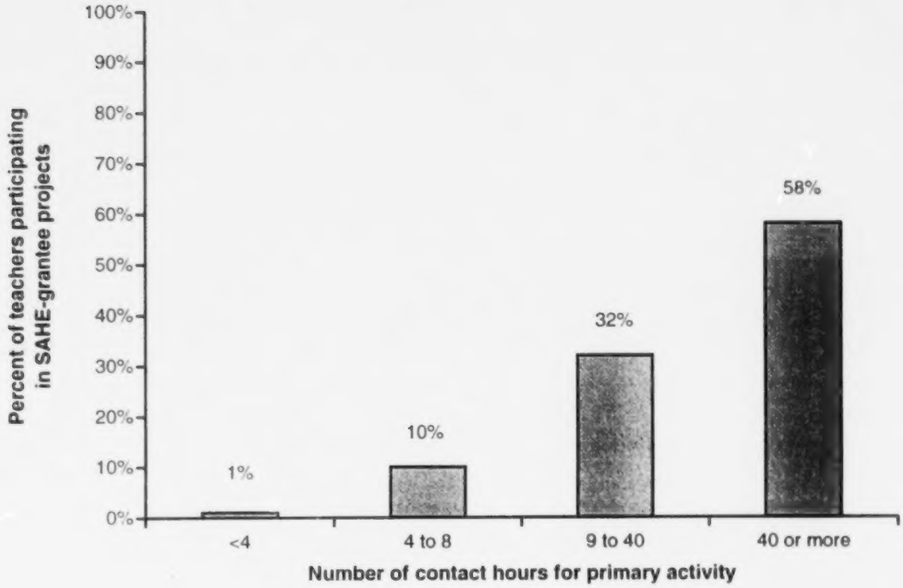
In addition to subject-area focus and type of activity, the duration of the activity is another important structural feature. Duration includes both contact hours and span across time in days, months, and years. To measure the duration of SAHE-grantee activities, we asked each project director across what period of time the project's primary activity extended and the total number of hours that it lasted.

Contact Hours

Each SAHE-grantee project director reported the number of contact hours the typical participant engaged in the grantees' primary activity. Responses, shown in Exhibit 6.6a, indicate that the majority of participating teachers (58 percent) are in projects that sponsor activities that last more than 40 hours. Thirty-two percent of teachers are in projects whose primary activity lasts between nine and 40 hours, 10 percent are in projects whose primary activity lasts between four and eight hours, and only one percent are in projects whose primary activity lasts less than four hours.

EXHIBIT 6.6a

Percent of Teachers Participating in SAHE-grantee Projects, by Contact Hours of Primary Activity (n=92)

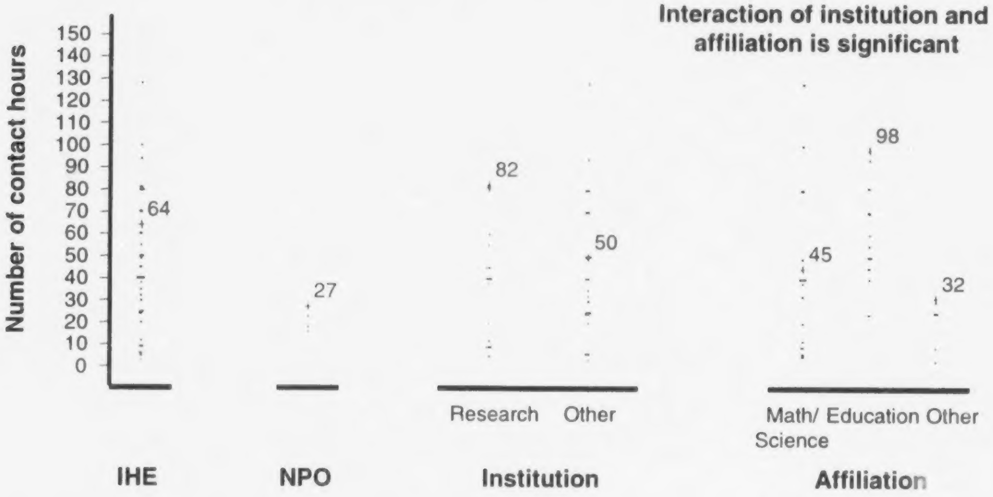


Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that one percent of teachers participating in SAHE-grantee projects are in projects whose primary Eisenhower-assisted professional development activity lasts less than four hours. Each bar and the number on top of it represent the percent of participating teachers for each category.

We now examine whether the number of contact hours of activities differs significantly by institution type or departmental affiliation. Exhibit 6.6b shows that SAHE-sponsored IHE projects range in contact hours from one to about 130 hours, with an average of 64 contact hours. Exhibit 6.6b also indicates that there are significant interactions between institution type and departmental affiliation. The pattern of interactions, shown in Exhibit 6.6c, indicates that SAHE-grantee projects housed in education departments in research/doctoral-granting universities have more than twice as many contact hours as other projects.

EXHIBIT 6.6b

Contact Hours of SAHE-grantees' Primary Activity, Overall and by Institution Type and Departmental Affiliation (n=92)

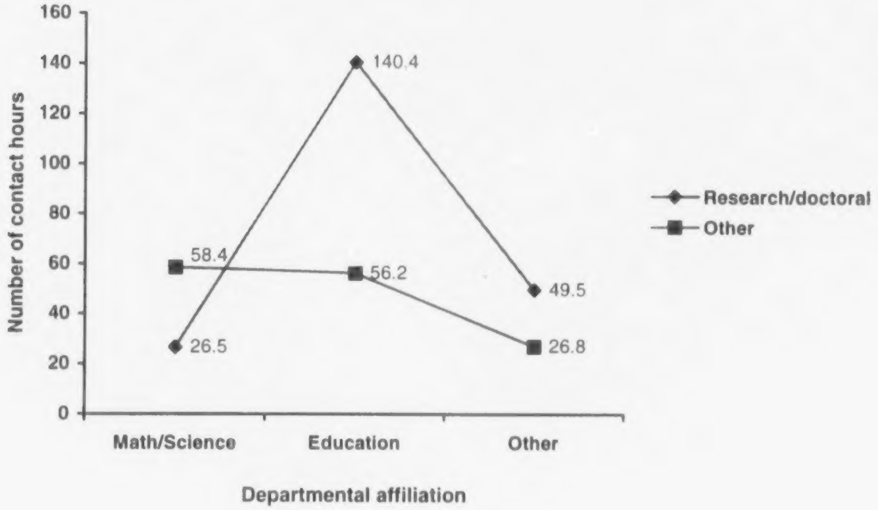


Interaction of institution and affiliation is significant

***Source*:** Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
***How to read this exhibit*:** The first distribution shows that on average, teachers in SAHE-grantee activities are in projects whose primary activity averages 64 hours. The amount of time of a project's primary Eisenhower-assisted professional development activity differs significantly by departmental affiliation but not by institution type. Each dot represents one IHE/NPO project. As the number of IHE/NPO projects at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.
Note: Values were truncated at 150 hours, so values above 150 do not appear on the distribution.

EXHIBIT 6.6c

Contact Hours of SAHE-grantees' Primary Activity, Interaction of Institution Type and Departmental Affiliation (n=86)



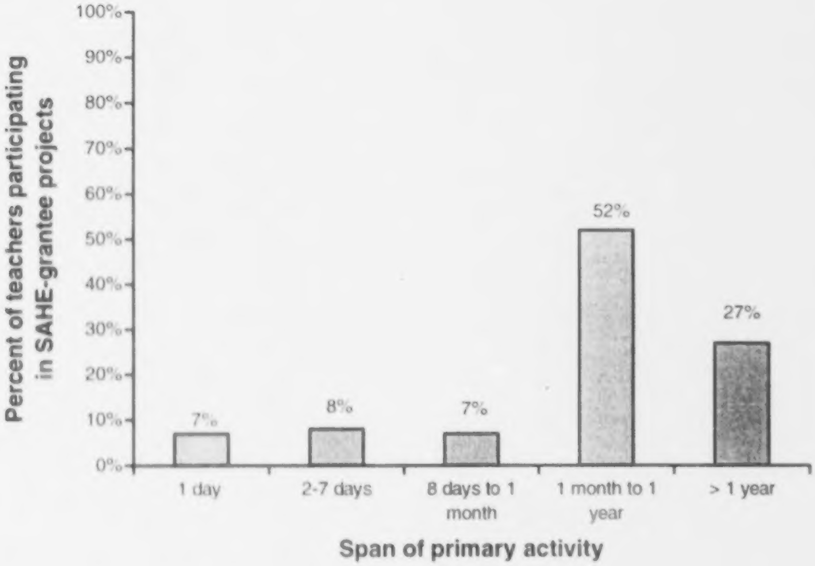
Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The data point designated by the first square indicates that in mathematics/science departments in nonresearch/doctoral-granting universities, the average number of contact hours in the primary Eisenhower-assisted project is 58.4. The line with data points designated by squares indicates the number of contact hours in projects of nonresearch/doctoral-granting institutions, in each of the three types of departments. The line with the data points designated by diamonds indicates the number of contact hours in projects at research/doctoral-granting institutions in each of the three types of departments.

Span

To measure the span of SAHE-grantee activities, we asked each project director to describe the time period over which the primary activity was spread, including the main activity and any formal preliminary or follow-up sessions. We asked for this information only for primary activities; thus the information is not available for internships, teacher resource centers, teacher committees/task forces, or individual research projects, which no IHE or NPO provided as a primary activity. Exhibit 6.7a shows that a little more than a quarter (27 percent) of participating teachers are in projects whose primary activity extends over more than one year, but the most common span of activities is between one month and one year; fifty-two percent of participating teachers are in projects whose primary activity spans this period of time. A substantial portion of participating teachers (22 percent) are in projects that sponsor primary activities that span less than one month.

EXHIBIT 6.7a

Percent of Teachers Participating in SAHE-grantee Projects, by Time Span of Primary Activity (n=92)

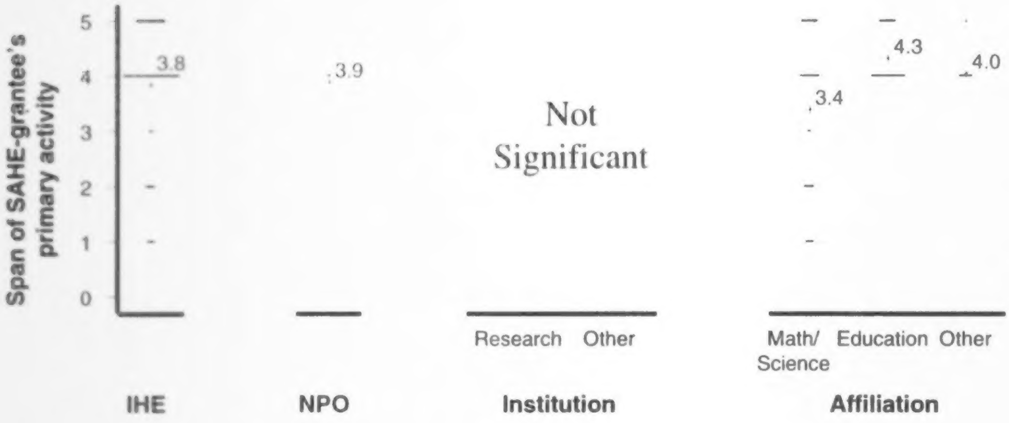


Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that seven percent of teachers participating in SAHE-grantee projects are in projects whose primary Eisenhower-assisted professional development activity spans one day. Each bar and the number on top of it represent the percent of participating teachers for each category.

Next we examine whether span differs for SAHE-supported IHE projects by institution type or departmental affiliation. The scale represented in Exhibit 6.7b has a range of one to five, where one equals one day and five equals greater than one year. Results in Exhibit 6.7b show that projects housed in mathematics/science departments range in span from one day to one year, and that no projects in education or "other" departments have a span of less than one month. The only significant differences are that IHE projects in education departments sponsor activities that are significantly longer in span (an average of about one month to one year) than IHE projects in mathematics or science departments (an average of three days to one month).

EXHIBIT 6.7b

Span of SAHE-grantees' Primary Activity, Overall and by Institution Type and Departmental Affiliation (n=92)



	Significant Pairwise Contrasts
Departmental Affiliation	Mathematics/Science vs. Education

***Source*:** Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
***How to read this exhibit*:** The first distribution shows that on average, teachers in SAHE-grantee projects are in projects in which the span of the primary activity is 3.8 (where one=one day, two=two to seven days, three=eight days to one month, four=one month to one year, and five=greater than one year). The time span of the project's primary Eisenhower-assisted activity differs significantly by departmental affiliation but not by institution type. Each dot represents one IHE/NPO project. As the number of IHE/NPO projects at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

In summary, our data indicate that SAHE-grantee activities generally are of long duration: 58 percent of participating teachers are in projects whose primary activity has 40 or more contact hours, and 79 percent are in projects whose primary activity spans more than one month (see Exhibits 6.6a and 6.7a, respectively). Part of the reason IHE/NPO activities have long durations is that many of them are college courses (26 percent of participating teachers are in projects whose primary activity is a college course), which, by design, meet several hours per week and are spread over several months. However, as we showed in Chapter 3, even workshops and reform activities tend to have long durations when provided by IHE/NPOs. This might be because IHEs adopt the paradigm of courses for many of the other types of activities that they provide. Also, the proposal guidelines that SAHEs establish might require activities of long duration. Another possible explanation is that IHEs are knowledgeable about and apply principles of adult education, which suggest that sustained activities are the most useful and effective. This explanation is supported by the fact that IHE projects in education departments have activities of longer duration than projects in mathematics or science departments. We would expect that project directors affiliated with education departments would be more familiar than project directors affiliated with mathematics/science departments with how to optimally design professional development opportunities for teachers; professors in education departments at research universities are the source of most of the current research and theoretical literature on effective professional development.

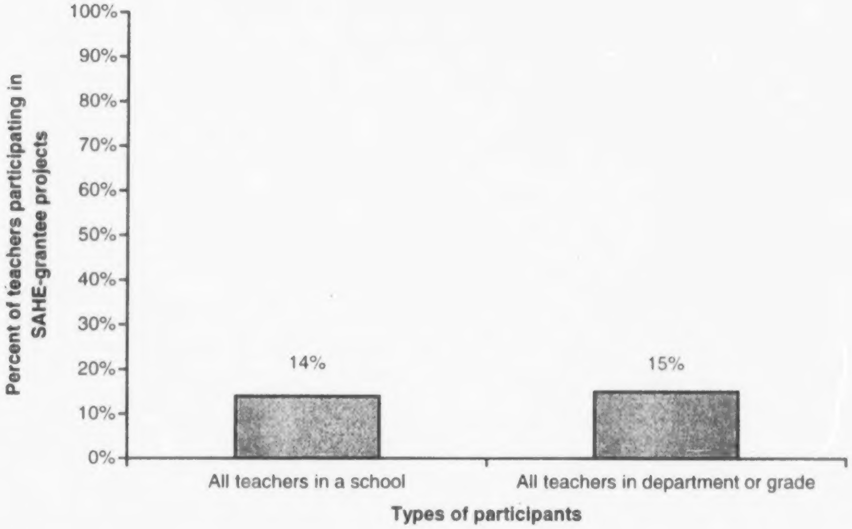
Collective Participation

The final structural feature of professional development that we discuss is collective participation, or the extent to which activities are geared toward the needs of groups of teachers or whole schools, rather than individual teachers. To measure collective participation in SAHE-grantee professional development activities, we asked each project director which of the following groups participated in the project's primary activity: 1) all teachers in department or grade-level groupings, and/or 2) all teachers in a school or set of schools (as opposed to teachers as individuals or teachers as representatives of their department, grade level, or school).

Exhibit 6.8a shows that 15 percent of participating teachers are in projects in which all teachers in a department or grade participate in the primary Eisenhower-assisted activity, and 14 percent are in projects in which that participation in the primary activity includes participation from all teachers in a school. These low rates of collective participation may be explained in part by the fact that IHEs commonly provide college courses, and teachers usually enroll in courses individually. In addition, teachers often compete to enroll in IHE activities. Participation by groups of teachers or whole schools in the same activity would be more likely to occur with a noncompetitive application process or a competition focused on whole schools, departments, or grades, rather than pre-designed workshops focused on individuals or courses for which the IHE/NPO seeks applicants.

EXHIBIT 6.8a

Percent of Teachers Participating in SAHE-grantee Projects Whose Primary Activity Involves Collective Participation (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 14 percent of teachers participating in SAHE-grantee projects are in projects whose primary activity includes participation by all teachers in a school. Each bar and the number on top of it represent the percent of participating teachers for each category.

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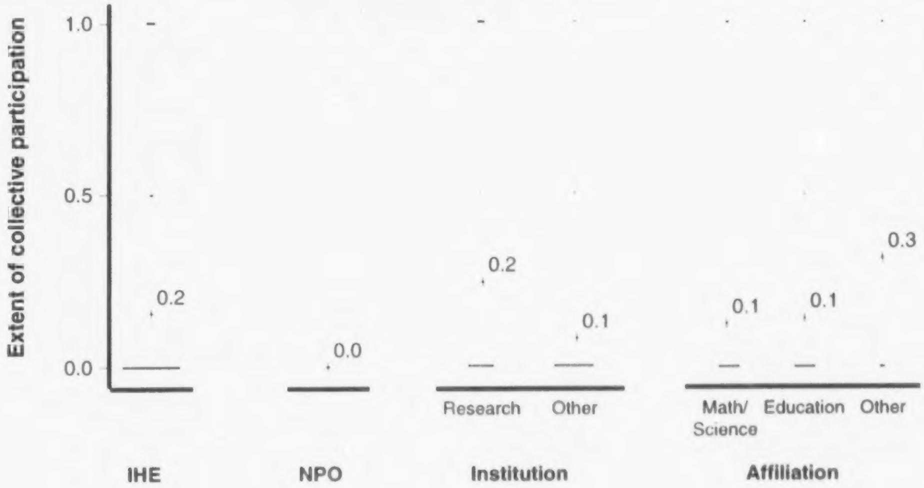
We averaged the two variables comprising the "collective participation" measure to analyze differences according to institution type and departmental affiliation. Analysis of this composite, illustrated in Exhibit 6.8b, shows that many SAHE grantees have neither of the two types of collective participation in their primary activity, while a few SAHE grantees have both types. Exhibit 6.8b also shows that there are significant differences in collective participation by institution type and departmental affiliation. Research/doctoral-granting institutions are significantly more likely than other types of IHEs to have collective participation. Differences by departmental affiliation are significant, but post hoc tests show that differences between any two types of departments are not statistically significant.

EXHIBIT 6.8b

Collective Participation in SAHE-grantee Projects, Overall and by Institution Type and Departmental Affiliation (n=92)



	Significant Pairwise Contrasts
Departmental Affiliation	Overall significant, but planned comparisons insignificant

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first distribution shows that on average, teachers in SAHE-grantee projects are in projects whose primary activity has a collective participation measure of .2, where zero=no collective participation, and one=includes both types of collective participation. The extent of collective participation differs significantly by both institution type and departmental affiliation. Each dot represents one IHE/NPO project. As the number of IHE/NPO projects at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

One possible explanation for these results is that "other" departments (examples in our survey include broadcasting, a college of business, and a university outreach department) may be more likely than mathematics/science or education departments to develop a particular program or course designed specifically for their Eisenhower project. In mathematics, science, or education, teachers may participate in professional development activities that are part of the regular university curriculum. "Other" departments may be less likely than education or mathematics and science

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departments to have relevant regular courses or programs that would draw teachers from various sources.

Summary: Structural Features of SAHE-grantee Activities

As with districts, SAHE grantees support predominately mathematics and science activities, but they also support activities in other subject areas. The reports from SAHE-grantee project directors about the structure of their activities mirror the reports from teachers, described in Chapter 3. SAHE grantees generally offer traditional types of activities—courses and workshops—although a few grantees, especially those in education and "other" departments, are trying reform activities. SAHE grantees have low levels of collective participation in their activities, but seem to structure their primary activities to support "sustained and intensive" learning. On average, activities last over 60 hours, and span between one month and a year. This provides a structure that could facilitate the implementation of content knowledge focus and high-quality learning strategies. We now turn to an analysis of the degree to which SAHE-grantee projects focus on those dimensions of quality.

CORE FEATURES OF PROFESSIONAL DEVELOPMENT

Section Findings

- *Most SAHE grantees report a strong content focus and the use of many types of active learning opportunities in their primary activity.*
- *Projects in mathematics/science departments have high content focus in both research/doctoral-granting and nonresearch/doctoral-granting IHEs; projects in education and other departments have high content focus only in research/doctoral-granting universities.*
- *Eisenhower project directors affiliated with education departments report significantly more active learning opportunities than project directors affiliated with mathematics/science departments.*

Activity type, duration, and the extent of collective participation are the structural features of a professional development activity. Our results in Chapter 3 demonstrated that these characteristics are associated with core features—that is, the methods, curriculum, and practices that comprise the professional development activity. Key aspects of the substance or core of an activity are a focus on content knowledge and opportunities for active learning.

The Eisenhower legislation does not specifically describe how quality should be defined, but it provides some guidance. The legislation states that professional development provided under the Eisenhower program, whether by the state, district, or an IHE/NPO, should be a program that "includes strong academic content and pedagogical components" (Section 2002(2)(C)) and "reflects recent research on teaching and learning" (Section 2002(2)(B)). Although the law does not specifically require activities to have particular characteristics, the legislation is founded on recent research in professional development that describes attributes of high-quality professional development:

> [P]rofessional development must be focused on teaching and learning in order to improve the opportunities of all students to achieve higher standards (Section 2001(4)(A)); effective professional development focuses on discipline-based knowledge and effective subject-specific pedagogical skills,…is interactive and collaborative, motivates by its intrinsic content and relationship to practice, builds on experience and learning-by-doing, and becomes incorporated into the everyday life of the school (Section 2001(4)(B)).

The literature on professional development also highlights the importance of content focus and active learning opportunities. The limited research that is available suggests that professional development is much more effective when it focuses on the content of subjects as well as on how students learn specific content, rather than general non-content-based teaching strategies (Cohen & Hill, 1998; Fennema et al., 1996; Kennedy, 1998). Also, studies have shown that professional development that offers opportunities for active learning, such as interacting with other participants, leading exercises, simulating practice, and obtaining feedback, are more likely to foster increased knowledge and skills and changes in teacher practice than other more passive learning techniques (Carey & Frechting, 1997; Darling-Hammond, 1997b; Lieberman, 1996; Schifter, 1996).

Focus on Content Knowledge

We measured both the content focus and active learning opportunities in each SAHE grantee's primary professional development activity. To measure the extent to which a grantee's primary activity is content-focused, we asked the project director how much emphasis the primary activity gives to deepening content knowledge; responses include "no emphasis," "some emphasis," or "strong emphasis." Results, shown in Exhibit 6.9a, indicate that five percent of teachers participating in SAHE-grantee projects are in projects whose primary activity places no emphasis on content knowledge, 23 percent of participating teachers are in projects whose primary activity places some emphasis on content knowledge in the primary activity, and 72 percent are in projects whose primary activity places a strong emphasis on content knowledge.

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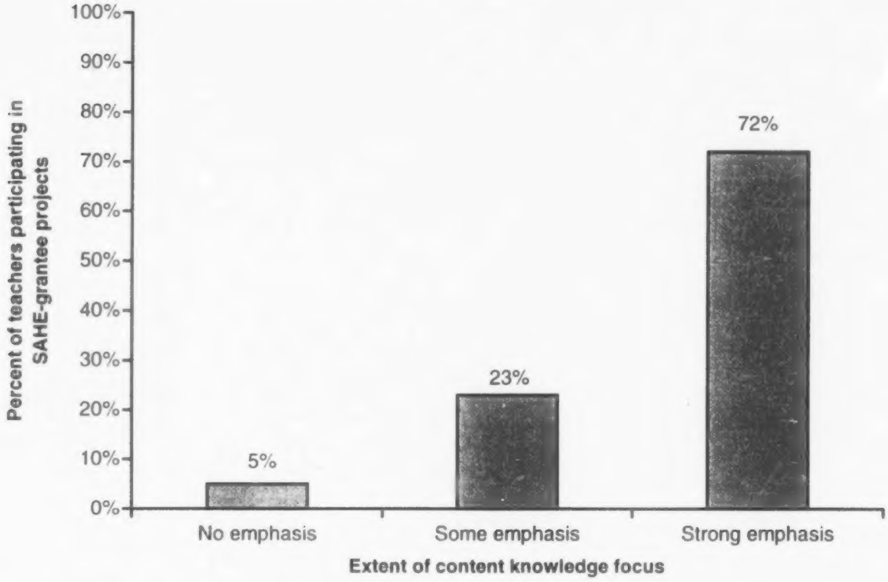
EXHIBIT 6.9a

Percent of Teachers Participating in SAHE-grantee Projects Whose Primary Activity Focuses on Content Knowledge (n=92)

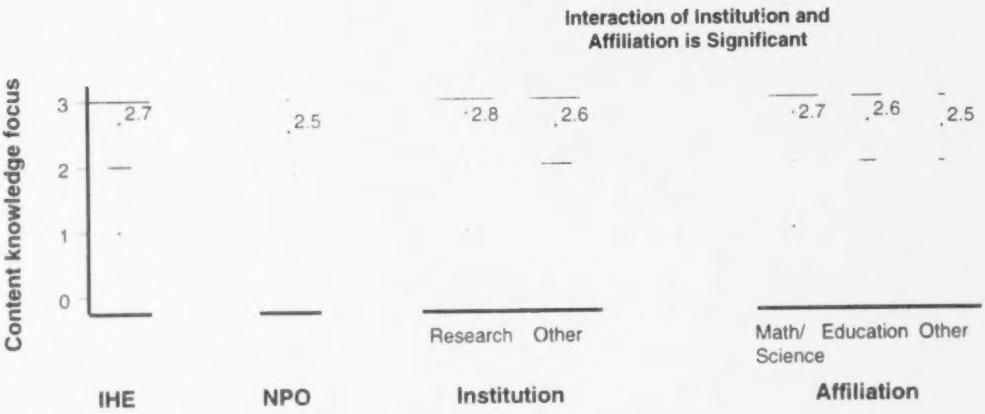


Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that five percent of teachers participating in SAHE-grantee projects are in projects whose primary activity has no emphasis on content knowledge. Each bar and the number on top of it represent the percent of participating teachers for each category.

Next we analyze content focus by institution type and departmental affiliation. Exhibit 6.9b shows that the means on the three-point content focus scale vary from one to three, but most are above two. Further, the interaction of institution type and departmental affiliation is significant. Exhibit 6.9c indicates that projects in mathematics/science departments have high content focus regardless of the type of IHE, while projects in education and other departments have a high content focus only if they are in research/doctoral universities.

EXHIBIT 6.9b

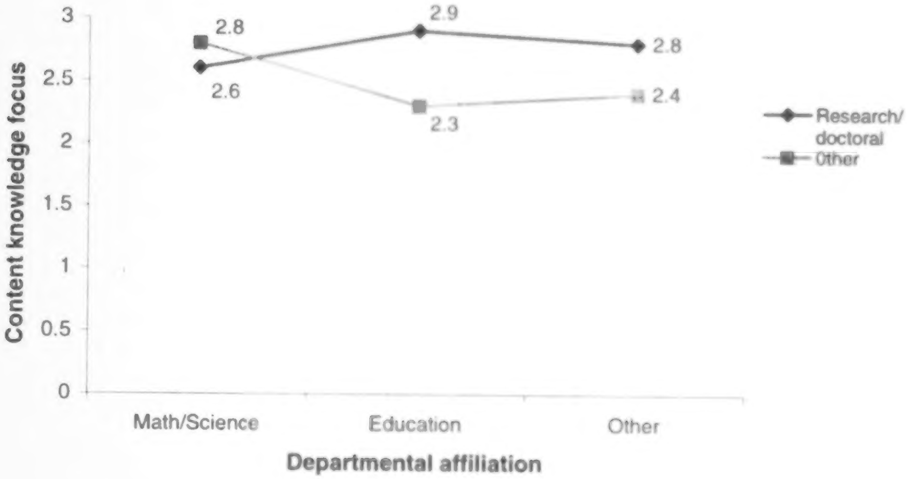
Extent of Content Knowledge Focus in SAHE-grantees' Primary Activity, Overall and by Institution Type and Departmental Affiliation (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first distribution shows that on average, teachers in SAHE-grantee projects are in projects whose primary activity has a content focus of 2.7, where zero=no emphasis on content and three=a strong emphasis on content. The interaction effects of institution type and departmental affiliation on content knowledge are significant. Each dot represents one IHE/NPO project. As the number of IHE/NPO projects at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

EXHIBIT 6.9c

Extent of Content Knowledge Focus in SAHE-grantees' Primary Activity, by Institution Type and Departmental Affiliation (n=86)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The data point designated by the first square indicates that the average extent of content knowledge in the primary SAHE-grantee project in mathematics/science departments in nonresearch doctoral-granting universities is 2.8 (where zero=no emphasis on content and three=a strong emphasis on content). The line with data points designated by squares indicates the extent of content emphasis of projects at nonresearch/doctoral-granting institutions, in each of the three types of departments. The line with the data points designated by diamonds indicates the extent of content emphasis of projects at research/doctoral-granting institutions, in each of the three types of departments.

These findings may reflect that SAHE grantees in research/doctoral-granting universities are more likely than those in nonresearch universities to be knowledgeable about the importance of content focus in professional development, and more equipped to provide strategies to learn substantive content. Also, mathematics/science departments may have a strong content focus across institutions types since those departments deal mainly with subject-specific topics, not pedagogical techniques.

Opportunities for Active Learning

To measure the second core feature—opportunities for active learning—we asked SAHE-grantee project directors about how their primary activity helps participants use new skills in their classroom. We asked them the following questions:

- Did participants receive coaching or mentoring in the classroom?
- Was participants' teaching observed by other participants and feedback provided?
- Did participants practice under simulated conditions, with feedback?
- Did you or other activity leaders observe participants' teaching and provide feedback?

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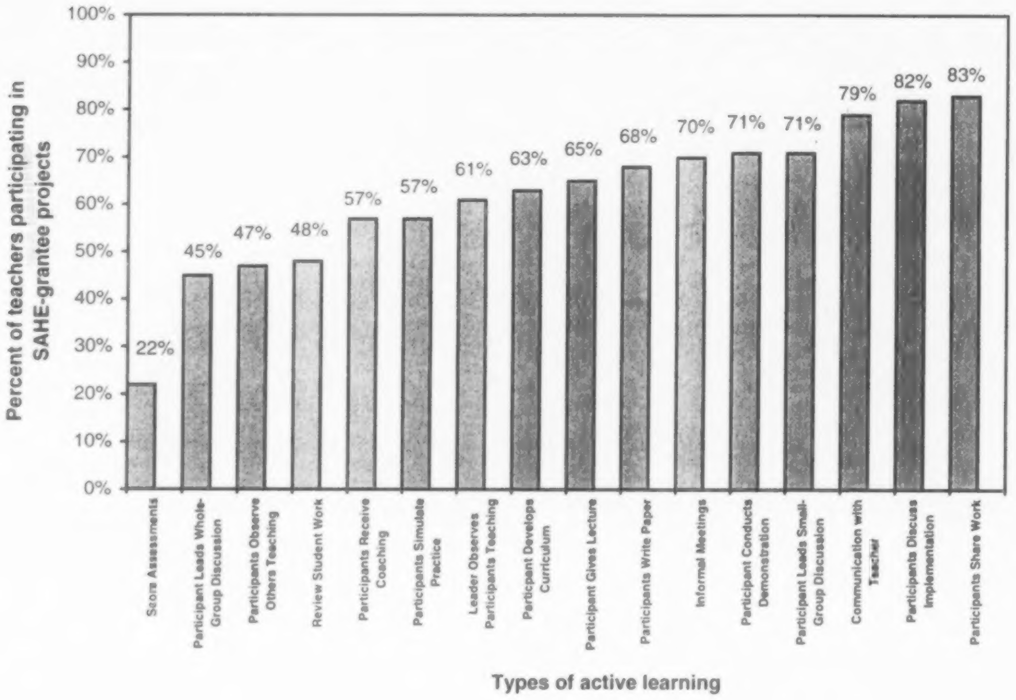
- Did participants meet formally with other participants to discuss classroom implementation?
- Did participants communicate with you concerning classroom implementation?
- Did participants share their students' work with you or other participants?
- Did participants meet informally to discuss classroom implementation?
- Did participants develop curricula or lesson plans that you or other participants reviewed?
- Did participants engage in the following during the activity:
    - Give a lecture or presentation of a lesson or unit?
    - Conduct a demonstration of a lesson or unit?
    - Lead a whole-group discussion?
    - Lead a small-group discussion?
    - Write a paper, report, or plan?
    - Review student work?
    - Score assessments?

Exhibit 6.10a shows that more than three-fourths of participating teachers are in projects whose directors report that in their primary Eisenhower activity, participants share work (83 percent), meet formally with other participants to discuss classroom implementation of the new skills that they learned in the professional development activity (82 percent), and communicate with the teacher (79 percent). Most participating teachers are in projects that offer activities that allow participants to lead a small-group discussion (71 percent), conduct a demonstration (71 percent), have informal meetings (70 percent), write a paper or report (68 percent), give a lecture (65 percent), develop a curriculum (63 percent), have the leader observe their teaching and provide feedback (61 percent), receive mentoring or coaching (57 percent), and practice under simulated conditions (57 percent).

A little less than half of participating teachers are in projects whose primary activity includes opportunities for teachers to review student work (48 percent), observe other teachers and provide feedback (47 percent), and lead whole-group discussions (45 percent). The least common active learning opportunity is having teachers score assessments; only 22 percent of participating teachers are in projects that include this method in their primary professional development activity. So it seems that most SAHE-grantee primary activities use a number of active learning strategies; among the most common strategies are communication and feedback with the activity leader, and among the least are strategies related to scoring and assessing student work.

EXHIBIT 6.10a

Percent of Teachers Participating in SAHE-grantee Projects That Provide Each of Sixteen Types of Opportunities for Active Learning in Primary Activity (n=92)

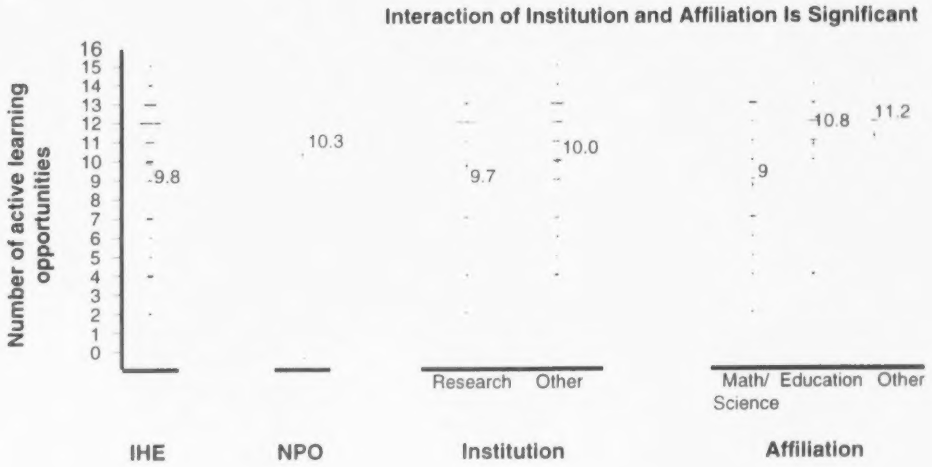


Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 22 percent of teachers participating in SAHE-grantee projects are in projects whose primary Eisenhower-assisted professional development activity uses the active learning strategy of scoring assessments. Each bar and the number on top of it represent the percent of participating teachers for each category.

Combining the 16 types of opportunities for active learning reported by the SAHE-grantees into a scale provides us with a measure of the number of types of opportunities for active learning that SAHE grantees offer, on a scale from 1 to 16. The index provides one measure of the diversity of learning strategies. Exhibit 6.10b illustrates the variation in the number of active learning opportunities that grantees provide in their primary Eisenhower-assisted activity. Some SAHE-grantee primary activities have as few as two active learning strategies in their primary activity, while others have as many as 15. Exhibit 6.10b also indicates that the interaction of institute type and affiliation is significant.

EXHIBIT 6.10b

Number of Types of Opportunities for Active Learning in SAHE–grantees' Primary Activity, Overall and by Institution Type and Departmental Affiliation (n=92)

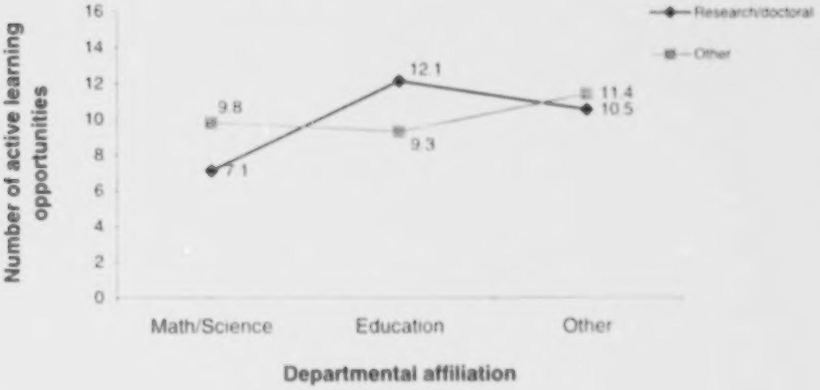


Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first distribution shows that on average, teachers in SAHE-grantee projects are in projects that have an average of 10 active learning opportunities for teachers in their primary Eisenhower-assisted professional development activity. The interaction effects of institution type and departmental affiliation on the number of types of opportunities for active learning is significant. Each dot represents one IHE/NPO project. As the number of IHE/NPO projects at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

An analysis of the pattern of interactions, shown in Exhibit 6.10c, reveals that among projects in education departments, those in research universities allow more opportunities for active learning than those in nonresearch universities. The opposite is true for projects in mathematics/science departments; they do better in nonresearch universities than in research universities. Among projects in research institutions, projects in the education departments provide many more active learning opportunities than projects in mathematics/science departments (12 compared to seven); but for projects in nonresearch universities, there is not much difference in the number of active learning opportunities provided by mathematics/science and education departments.

EXHIBIT 6.10c

Number of Types of Opportunities for Active Learning in SAHE-grantees' Primary Activity, Interaction of Institution Type and Departmental Affiliation (n=86)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The data point designated by the first square indicates that in mathematics/science departments in nonresearch/doctoral-granting universities, the average number of active learning opportunities in the primary SAHE-grantee project is 9.8. The line with data points designated by squares indicates the number of active learning opportunities in projects at nonresearch/doctoral-granting institutions, in each of the three types of departments. The line with the data points designated by diamonds indicates the number of active learning opportunities in projects at research/doctoral-granting institutions, in each of the three types of departments.

Thus, projects in research universities do better only if they are affiliated with the education department; otherwise, nonresearch universities have more active learning opportunities. This may indicate that, unless they are in an education department, research university professors are more inclined to practice traditional lecturing and non-active learning techniques than professors in other types of universities. Education departments are more equipped to offer alternative pedagogical strategies, and are more knowledgeable about learning techniques, perhaps because pedagogy and learning techniques are a fundamental part of their focus and curricula. In contrast, mathematics and science departments in research universities are more likely to focus on subject matter and less on pedagogical techniques such as active learning.

Further, projects in non-mathematics/science or education departments at nonresearch universities do almost as well in providing active learning opportunities as projects in education departments at research universities. These are departments such as media and broadcasting, whose activities are likely to focus on active, hands-on programs.

Summary: Core Features of Professional Development

SAHE-grantee project directors generally report that their primary Eisenhower-sponsored activity has a strong emphasis on content and offers many types of active learning opportunities. These findings are consistent with our data from teachers, reported in Chapter 3, which indicate high levels of content focus and active learning opportunities in IHE-sponsored professional development activities. It seems that IHE/NPOs structure their activities in ways that facilitate high-quality core features, by establishing activities of long duration, and IHE/NPOs implement the pedagogical strategies that the Eisenhower legislation and the professional development literature emphasize as important for changing teacher knowledge and behavior. Further, projects in education and "other" departments have a strong content focus only in research/doctoral-granting universities, while projects in mathematics/science departments have a high content focus regardless of institution type. Projects in education departments in research/doctoral-granting universities do better than others in active learning.

The question for policy is to identify the reasons for the high average quality of SAHE-grantee activities. One explanation is that IHE/NPO projects are competitive, and the SAHE review process may favor depth over breadth, and may in some cases require grantees to provide activities of a certain duration. Another explanation is that IHE/NPOs spend more than twice as much Eisenhower money per teacher participation as districts do; conversely, IHE/NPOs may spend more money per teacher because the high-quality activities that they design require it. In 1997-98, districts spent an average of $185 per teacher participation, while IHEs spent an average of $512 per teacher participation.[12] Thus on average IHE/NPOs distribute their funds across fewer teachers than districts do. Apparently, districts seek to reach as many teachers as possible (breadth), while IHE/NPOs seek to provide a high-quality professional development experience to teachers (depth), even though this means reaching fewer teachers. This may reflect the different roles that IHE/NPOs and districts play. Perhaps districts feel a responsibility to serve all of their teachers, while IHE/NPOs do not have a specific constituency of teachers to whom they feel responsible.

Our analyses of differences by institution type and departmental affiliation can perhaps shed some light on these suppositions. Perhaps a large part of the reason that projects in education departments at research/doctoral institutions support activities that last longer and offer more opportunities for active learning than projects in mathematics/science departments is that the directors in education departments are more familiar with the research on high-quality professional development.

Finally, projects in mathematics/science departments emphasize content knowledge regardless of the type of university they are housed in, while projects in education and other departments emphasis content knowledge only if they are in a research university. This may suggest that project directors at nonresearch universities affiliated with education or other (non-mathematics/science) departments need more training and knowledge about the importance of focusing on content and how children learn specific content in the structure and implementation of their professional development activities.

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[12] For 1996-97, states reported in their SAHE reports that there were 92,000 teacher participations in professional development. To calculate dollars per participation, we assumed that 95 percent of the 16 percent of the total Eisenhower appropriation that is earmarked for IHE/NPOs goes to IHE/NPOs. The 1997-98 appropriation was $310 million; thus dollars per participation for IHE/NPO projects was $512. In the SEA reports in 1996-97, states reported that the number of participations in professional development in districts was equal to 1.27 million. Assuming that 90 percent of the earmarked 84 percent of the $310 million Eisenhower appropriation goes to districts, the dollars per participation for districts was $185. This estimate is for Eisenhower dollars only; the total average cost for districts may be one-third higher than estimated here, given Title II's cost sharing requirement (Section 2209a and b).

IHE/NPO-provided Eisenhower-assisted in-service activities, described in this chapter generally, have several characteristics of high quality. The competitive process of the SAHE component of the Eisenhower program may promote quality; and it may be that only the most qualified faculty members pursue and receive awards to direct Eisenhower projects.

TARGETING AND RECRUITMENT OF TEACHERS

Section Findings

- *Most teachers participating in SAHE-grantee projects are in projects whose directors say that they target Title I teachers, and teachers in high-poverty and low-achieving schools. The majority of participating teachers are in projects whose directors report that they do not target teachers of special education or limited-English proficient students.*
- *Over three-fourths of participants in SAHE-grantee projects volunteer to participate, and most of the rest are selected by the principal.*
- *Most participating teachers are in projects that try to increase participation in their professional development activities by publicizing them, and about half are in projects that try to increase participation by tailoring the focus of the activities and/or using incentives.*

Teachers cannot benefit from high-quality professional development activities if they do not participate in them. While individual initiative influences the extent to which teachers take advantage of opportunities, teachers' opportunities for professional development also are shaped, in part, by the extent to which they are targeted and recruited to participate in activities. As we discussed in Chapters 3 and 4, the Eisenhower legislation emphasizes the importance of addressing the needs of teachers of diverse student populations. These general provisions of the law for teachers of students of diverse needs apply not only to districts, but also to SAHE grantees. Specifically, the law provides that teachers (and others) should have access to professional development that incorporates effective strategies, techniques, methods, and practices for meeting the educational needs of diverse student populations, including females, minorities, individuals with disabilities, limited-English-proficient individuals, and economically disadvantaged individuals, in order to ensure that all students have the opportunity to achieve challenging state student performance standards (Section 2002(2)(D)).

Increasing the participation of teachers of diverse student populations is important because teachers in schools with high populations of at-risk students are generally less experienced, have fewer resources in their schools, and face students who are often more challenging to teach (Darling-Hammond, 1997a; U.S. Department of Education, 1999a). These teachers are often more in need of professional development than their counterparts in middle-class schools (Darling-Hammond, 1997a; U.S. Department of Education, 1999a), and they also are less likely to participate in professional development activities (U.S. Department of Education, 1998a).

Targeting Teachers of Special Populations of Students

To see how well SAHE grantees target their professional development practices to teachers of the diverse student populations outlined in the legislation, we asked SAHE-grantee project directors a series of questions about their targeting and recruitment practices.[13] We asked them how much emphasis they give to recruiting different types of teachers for their activities—Title I teachers, special education teachers, teachers of limited-English-proficient students, teachers from schools with low-achievement levels, and teachers from high-poverty schools (i.e., schools in which 50 percent or more students are eligible for free or reduced-price lunch). Exhibit 6.11 shows the percent of teachers in SAHE-grantee projects whose project director reports placing "no particular emphasis," "some emphasis," or a "strong emphasis" on each of these groups of teachers.

About three-quarters of teachers participating in SAHE-grantee projects are in projects that report placing some or a strong emphasis on recruiting teachers in high-poverty schools (72 percent) and low achieving schools (71 percent). A little more than half of participating teachers are in projects that emphasize recruiting Title I teachers (55 percent), and more than one-quarter are in projects that target special education teachers (31 percent) and teachers of limited English proficient students (29 percent).

To measure the extent of targeting, we created a scale that combines the emphasis SAHE grantees give to recruiting the five types of teachers shown in Exhibit 6.11, where 1=no particular emphasis, 2=some emphasis, and 3=strong emphasis. An analysis of the scale indicates that the extent of targeting does not differ significantly by institution type or departmental affiliation.

One reason that SAHE grantees report high levels of targeting for teachers of some groups of students may be due to SAHE requirements for targeting special populations of teachers. In one of our case studies in Kentucky, the SAHE Eisenhower coordinator indicates that Eisenhower proposals from IHEs must ensure opportunity for equitable participation by teachers of historically underrepresented/underserved segments of society. This consideration extends to gender, economics, disabilities, and racial minorities. In addition, the SAHE reports making aggressive efforts to recruit for participation teachers who are racial minorities, and teachers of minority or disabled students. For example, the SAHE supports specific projects designed for particular groups of teachers. One project is designed to introduce methodology, technology, and classroom practices for teachers of special-need students, and another project is designed for racial minority students to be involved and participate in particular exercises in the professional development activities. Similarly, in Texas, an IHE project coordinator reported that although teachers in Title I schools are not specifically targeted by districts for professional development, SAHE professional development grants have always

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[13] Data presented in the next three sections, on targeting, alignment and coordination, and continuous improvement, refer to general SAHE-grantee activities, not just the primary activity.

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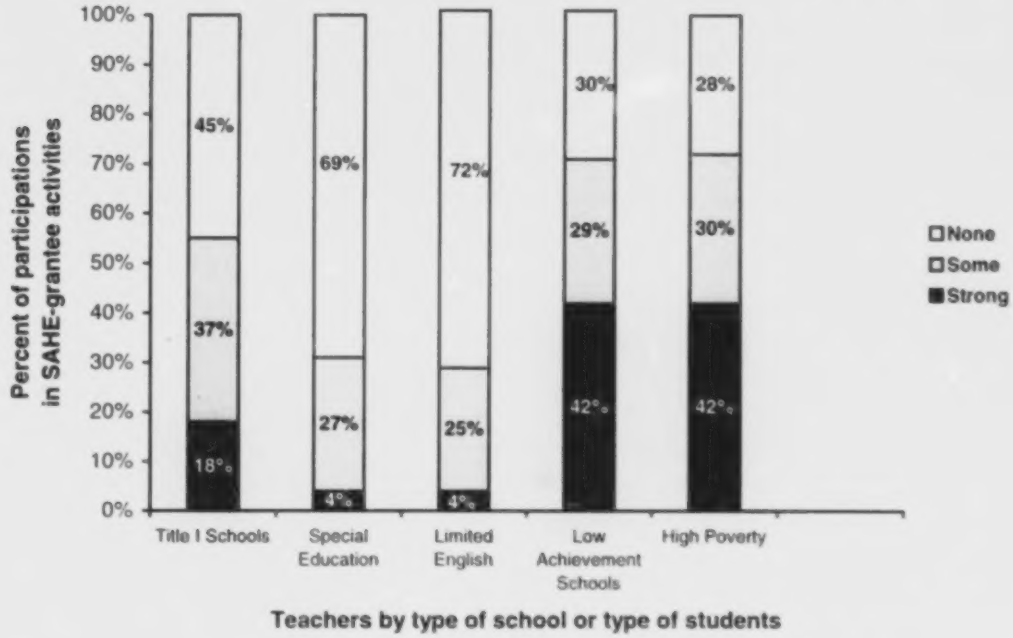
EXHIBIT 6.11

Percent of Teachers Participating in SAHE-grantee Projects Whose Directors Report Placing No, Some, or a Strong Emphasis on Recruiting Teachers of Special Student Populations (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
***How to read this exhibit*:** The first bar shows that 45 percent of teachers participating in SAHE-grantee projects are in projects whose director reports placing no emphasis on recruiting Title I teachers; 37 percent of participating teachers are in projects whose director reports placing "some" emphasis on recruiting Title I teachers; and 18 percent of participating teachers are in projects whose director reports placing a "strong" emphasis on recruiting Title I teachers. Each shaded section of the bar and the number at the top of it represent the average percent of participating teachers for each category.

targeted teachers of underrepresented minority and disadvantaged students for recruitment and participation.

Our survey data show that less than 20 percent of teachers participating in SAHE-grantee projects are in projects whose director places a "strong" emphasis on targeting teachers in Title I schools. In our case-study interviews, the project director at a university in Texas offers an explanation for why she does not target Title I teachers. She says that there is no specific targeting of Title I teachers because so many of the schools that they work with are Title I schools; only two or three of the schools in the three districts that she works with are not Title I schools.

In addition to targeting, we also examined how teachers come to participate in SAHE-grantee professional development activities. We asked SAHE-grantee project directors what percent of the teachers in their Eisenhower activities come to participate in each of several ways: volunteering, selection by their principal or other administrator, rotation, or other ways. Exhibit 6.12 shows the most common ways teachers come to participate in SAHE-grantee projects.

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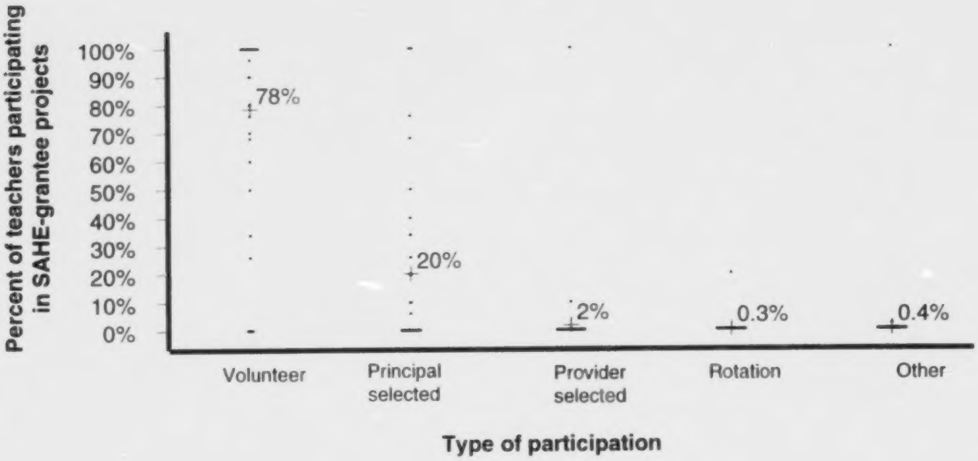
EXHIBIT 6.12

Percent of Teachers Participating in SAHE-grantee Projects, According to How Teachers Come to Participate (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
***How to read this exhibit*:** The first distribution shows that on average, 78 percent of participating teachers are in SAHE-grantee projects in which participation comes from volunteers. Each dot represents one IHE/NPO project. As the number of IHE/NPO projects at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

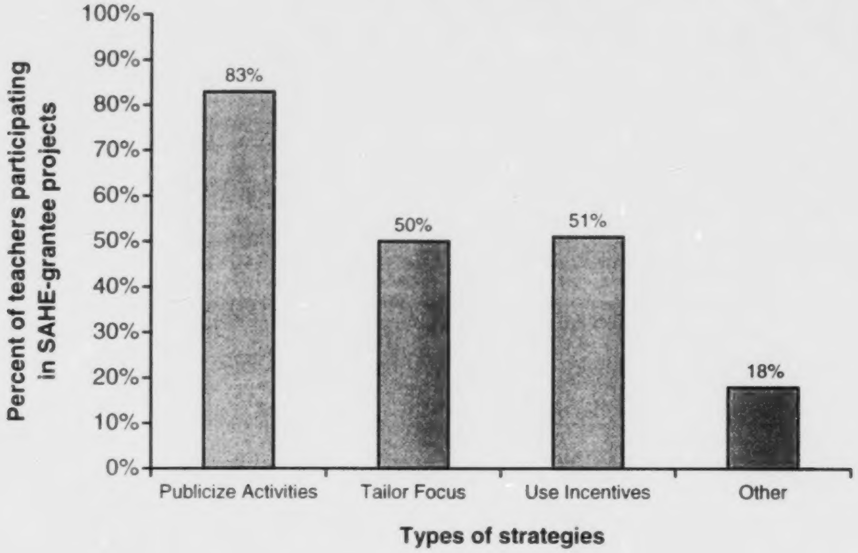
By far the most common method is having teachers volunteer; seventy-eight percent of participations in SAHE-grantee projects come about by having participants volunteer. Twenty percent of participations occur through principal selection. The remaining channels of participation comprise less than five percent of total participations. SAHE grantees vary in the extent to which they rely on these methods. For example, some participating teachers are in projects that rely exclusively on teacher volunteers, while some are in projects that rely entirely on teachers selected by principals.

Methods of Increasing Teacher Participation

We asked SAHE grantees how they try to increase the participation of teachers, paraprofessionals, or others in their activities. Choices included publicizing activities, using incentives, tailoring the focus of professional development toward the needs of special populations, or other strategies. Exhibit 6.13 shows which of these strategies SAHE grantees use. The method used by most SAHE-grantee project directors is publicizing activities (83 percent of participating teachers are in projects that use this method). About half of participating teachers are in projects that use incentives to increase participation (51 percent) and tailor the focus of their activities (50 percent); only 18 percent are in projects that use other methods for increasing participation.

EXHIBIT 6.13

Percent of Teachers Participating in SAHE-grantee Projects That Use Various Strategies to Increase Participation (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 83 percent of teachers participating in SAHE-grantee projects are in projects that publicize activities to increase participation. Each bar and the number on top of it represent the percent of participating teachers for each category.

Summary: Targeting and Recruitment of Teachers

Despite IHE/NPO efforts at recruiting, the effect that this has on actual participation is unclear, since nearly 80 percent of participants are volunteers. Teachers of disadvantaged students may not participate in high numbers even though the activity may be targeted toward them. In Chapter 3 we reported that the actual participation rates of these teachers in Eisenhower-assisted activities are much lower than the SAHE-grantee reports of targeting would predict. The heavy reliance on volunteer participants might help to explain why these participation rates do not reflect reported targeting efforts. Alternative targeting and recruitment efforts, such as sponsoring activities in which the whole school participates, may be effective in increasing the participation of teachers of special populations of students, but in some cases this approach may be unrealistic to implement on a large scale.

BUILDING A VISION FOR PROFESSIONAL DEVELOPMENT: ALIGNMENT WITH STANDARDS AND ASSESSMENTS, AND COORDINATION WITH OTHER PROGRAMS

Section Findings

- *Most teachers in SAHE-grantee projects are in projects whose directors say that state standards play a role in the design of their Eisenhower professional development [illegible] however, state assessments and district standards and assessments are much less likely to play a role in project design. Projects in nonresearch universities are better aligned with state and district standards and assessments than projects in research universities.*

- *Few participating teachers are in projects that have ongoing feedback mechanisms with districts, work with the district Eisenhower coordinators, or co-fund with federal programs. However, most participating teachers are in projects that work with districts in other ways. These include working closely with staff from other federal programs, communicating with district staff, and relying on district needs assessments to plan the professional development project.*

- *IHE projects housed in education departments engage in significantly more types of coordination with districts than do projects in mathematics/science departments.*

State and district standards and assessments provide a vehicle for unifying reforms and professional development. Thus one method of designing and developing a program of professional development is to base the activities, pedagogy and curriculum on standards or assessments adopted by the state or district, and to work with other programs in the state and district to develop a coherent reform strategy

In the law, Congress intended that SAHE grantees be part of system-wide reform efforts. The law requires SEAs to develop a state professional development plan to improve teaching and learning and to develop the plan in conjunction with SAHEs (Section 2205 (b)(2)(A)). Similarly, SAHE grantees must follow the law's general provisions for alignment with state standards. Specifically, SAHE-sponsored professional development should help to ensure that professional development is linked to state content and performance standards (Section 2002(2)(A)).

In addition to general provisions about alignment, the Eisenhower program specifically describes particular coordination requirements for IHE/NPO projects. While the SAHE component of the program operates separately from the LEA component of the program, IHE/NPOs that receive Eisenhower grants are expected to work in conjunction with LEAs. Specifically, the legislation provides that

> …the State agency for higher education, working in conjunction with the State educational agency (if such agencies are separate), shall make grants to, or enter into contracts or cooperative agreements with, institutions of higher education and nonprofit organizations of demonstrated effectiveness, including museums and educational partnership organizations,

> which must work in conjunction with a local educational agency, consortium of local educational agencies, or schools...(Section 2211(a)(1)).

In fact, the Eisenhower legislation requires that SAHE grantees establish a formal relationship with one or more school districts. It states that

> No institution of higher education may receive assistance under (a)(1) of this subsection unless the institution enters into an agreement with a local educational agency, or consortium of such agencies, to provide sustained, high-quality professional development for the elementary and secondary school teachers in the schools of each such agency (Section 2211(a)(3)).

The importance of alignment and coordination also is emphasized in the literature. Linking professional development with other programs and reforms helps to provide a coherent vision of professional development (Elmore & Burney, 1996; Guskey, 1997), and teachers recognize when there are inconsistencies among these factors (Grant, Peterson, & Shojgreen-Downer, 1996). Researchers have emphasized the important role that standards and assessments can play in designing and implementing professional development and how coordination, in the form of co-funding, can bring coherence to a professional development plan (Elmore & Burney, 1996). While this literature focuses on school districts, SAHE grantees also can be a part of the overall vision if they are aligned and coordinated with the districts.

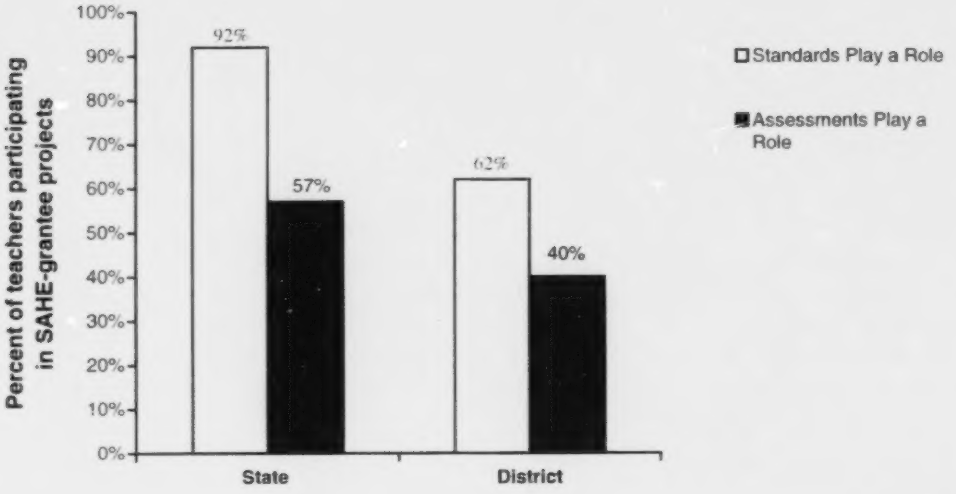
Although SAHEs are not in the same position as districts are to build professional development as part of a systemic reform strategy, they can establish their own vision for integrating their grantee activities into district and state reform strategies, and in this way can be part of the district and state's vision for reform. The extent to which SAHE-grantee projects link their professional development design, implementation and management with district and state reforms can be measured by the projects' 1) alignment with state and district standards and assessments, and 2) extent of coordination with the district and with other federal programs.

Alignment of Eisenhower-assisted Activities with State and District Standards and Assessments

To test the extent to which SAHE-grantee activities are aligned with state and district standards and assessments, we asked SAHE-grantee project directors if "state standards or frameworks" and "state assessments" played a role in designing their Eisenhower project; we asked similar questions about district-level standards and assessments. Responses, shown in Exhibit 6.14a, indicate that standards are more likely to play a role in project design than assessments. Almost all teachers participating in SAHE-grantee projects (92 percent) are in projects that report that state standards play a role in project design, while only 62 percent of participating teachers are in projects in which district standards play a role in project design. Fifty-seven percent are in projects in which state assessments play a role in project design, compared to 40 percent in projects in which district assessments play a role.

EXHIBIT 6.14a

Percent of Teachers Participating in SAHE-grantee Projects in Which State and District Standards and Assessments Play a Role in Project Design (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 92 percent of teachers participating in SAHE-grantee projects are in projects whose project directors report that state standards play a role in their Eisenhower project design. Each bar and the number on top of it represent the percent of participating teachers for each category.

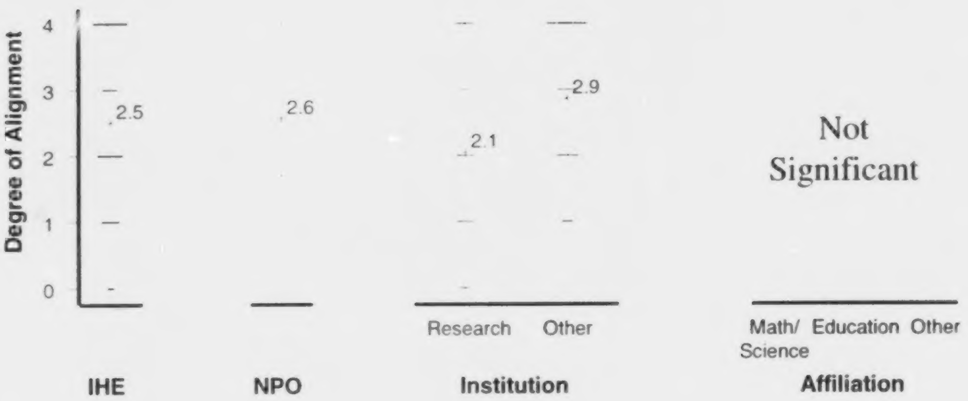
For SAHE grantees, as with districts, standards are much more likely to play a role in Eisenhower activities than are assessments. This may be because more states have standards than assessments, and even states with assessments may not have their assessments well-aligned with their standards. Further, state standards are more likely than district standards to play a role in SAHE-grantee project design. Perhaps because SAHE grantees submit their proposals to the state, not to districts, there may be an automatic feedback and accountability loop that encourages grantees to be responsive to state standards. Several IHE project directors offer evidence of the importance of this link with the state. One project director from Ohio explains that her state has outcome requirements that are mandated, and the Eisenhower project is adapted to meet those state outcomes and meet the standards set by the state. A New York IHE project director also says that the implementation of the Eisenhower program was a response to statewide reforms in the mathematics and science curriculum. Similarly, an IHE project director in Kentucky says that the Eisenhower program in her state gives preference to projects that relate to the state's learning goals and academic expectations for mathematics and science. Preference is given to projects aligned with the state assessments' core content, the Kentucky Instructional Results Information System (KIRIS).

Further, district standards may be more difficult to incorporate into SAHE-grantee professional development activities because grantees often work with multiple districts. Also, in the proposal that IHE/NPOs submit to the SAHE, they have to detail the Eisenhower professional development activities that they have planned. In some cases, identification of a district may occur after the grant is awarded, so district standards would have little or no influence on the design and development of the activity. If this is the case, requiring IHE/NPOs, in the proposal process, to identify and connect with the district from which they will draw participants for their Eisenhower project would help foster responsiveness to district goals and standards. As it now stands, it seems that the requirement for IHE/NPOs to "enter[s] into an agreement" with the LEA with which they plan to work may not be as visible in some state competitions as it could be. It could also be the case that some existing agreements have more form than substance. Our measures of alignment are limited, however, because they do not capture the extent to which informal, on-going communication and collaboration between IHE/NPOs and districts might affect alignment.

To examine whether the extent of alignment varies by institution type and departmental affiliation, we created a composite measure of alignment. We added the responses to the four alignment questions; the scale ranges from 0 to 4, where 0 means no state or district standards or assessments play a role in project design, and 4 means standards and assessments from both the state and districts play a role in project design. Results, shown in Exhibit 6.14b, indicate that there is variation across IHE/NPOs in the extent to which projects are aligned.

EXHIBIT 6.14b

Degree of Alignment between SAHE-grantees' Eisenhower Project and State and District Standards and Assessments, Overall and By Institution Type and Departmental Affiliation (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first distribution shows that on average, teachers in SAHE-grantee projects are in projects that have an average alignment of 2.5, on a scale of zero to four, where zero indicates no alignment and four indicates alignment with district and state standards and assessments. Alignment differs significantly by departmental affiliation but not by institution type. Each dot represents one IHE/NPO project. As the number of IHE/NPO projects at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

Projects do not differ significantly in alignment according to departmental affiliation, but nonresearch/doctoral-granting universities report more alignment with state and district standards and assessments than do research/doctoral-granting universities. This finding may reflect the fact that "other" colleges are more likely than research universities to have large teacher training programs, and thus are more likely to work with states and districts. Also, it may be that project directors at research/doctoral-granting universities are more likely to have their own research agendas that they use to shape their Eisenhower projects. In contrast, project directors at nonresearch/doctoral-granting universities are less likely to be engaged in ongoing research, and thus may be more inclined to shape their project around the state's and district's goals and interests.

Coordination with Other Programs

To be a part of building an effective professional development strategy, SAHE-grantee projects need to be coordinated with other programs in the district in which they are working. We asked several questions to measure the extent to which SAHE grantees coordinate their efforts with local districts.

The legislation requires each SAHE grantee to establish a cooperative agreement with the LEA and/or districts with which it works (Section 2211(3)). Of those teachers participating in SAHE-grantee projects that work with only one district, 58 percent are in projects whose directors have formal cooperative agreements with the district. Of those in projects that work with multiple districts, 71 percent are in projects whose directors report having formal agreements with one or more of these districts. Since these data are project director self-reports, the lack of formal agreements is probably at least as great as the data show, and these results suggest that many SAHE grantees are not complying with the legislation's directive to secure an agreement with the district.

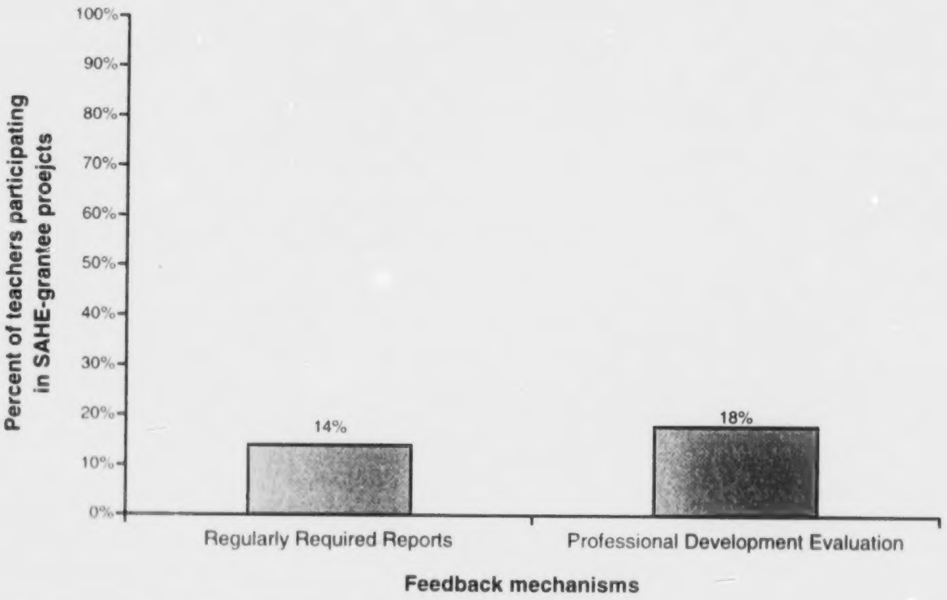
In addition to asking about formal agreements, we asked a series of questions about how SAHE grantees interact with district staff. We identified five separate dimensions of coordination: 1) feedback mechanisms; 2) support and extension of district activities; 3) ways of working with districts; 4) district involvement in planning, implementing, or monitoring; and 5) co-funding with other federal programs.

Feedback Mechanisms

To examine the required feedback mechanisms between SAHE grantees and districts, we asked each project director if either of the following feedback mechanisms takes place between the project and the district: regular required reports and required evaluations of professional development activities. Exhibit 6.15 shows that 18 percent of participating teachers are in projects that are required to provide districts with an evaluation of professional development activities, and 14 percent are in projects that are required to complete reports for the district. We conclude that IHE/NPO projects generally do not feel responsible to districts; however, they do demonstrate a responsibility toward states, possibly because, as previously discussed, it is through states that they receive their Eisenhower funds.

EXHIBIT 6.15

Percent of Teachers Participating in SAHE-grantee Projects That have Ongoing Feedback Mechanisms with Districts (n=92)



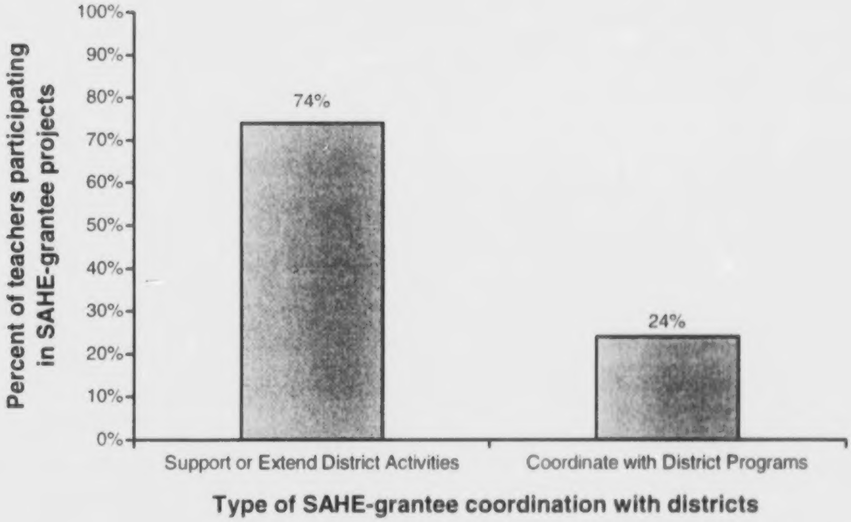
Source Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit. The first bar shows that 14 percent of teachers participating in SAHE-grantee projects are in projects whose directors say that regularly required reports exist as an ongoing feedback mechanism between them and the district. Each bar and the number on top of it represent the percent of participating teachers for each category.

Support and Extension of District Activities

Another dimension of coordination is the extent to which SAHE-grantee projects are designed to support, extend, and coordinate with district activities. We asked each SAHE-grantee project director if the Eisenhower project was designed to support or extend professional development activities in the district, and whether the Eisenhower project was coordinated with district programs or reforms. Responses, shown in Exhibit 6.16, show that almost three-quarters (74 percent) of participating teachers are in projects whose directors report that their activities are designed to support or extend district professional development activities. However, less than one-quarter (24 percent) of participating teachers are in projects whose directors report coordinating with district programs and reforms. These results, again, probably reflect the SAHE-grantee project application process. Districts and IHE/NPOs may choose to work with each other when the IHE/NPO project fits with district professional development activities, but IHE/NPO projects are less likely to be coordinated with district reforms and programs than with state standards, because IHE/NPOs must be responsive to state priorities in their grant proposals.

EXHIBIT 6.16

Percent of Teachers Participating in SAHE-grantee Projects That Support and Coordinate with District Professional Development Activities and Programs (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 74 percent of teachers participating in SAHE-grantee projects are in projects designed to support or extend other district professional development activities. Each bar and the number on top of it represent the percent of participating teachers for each category.

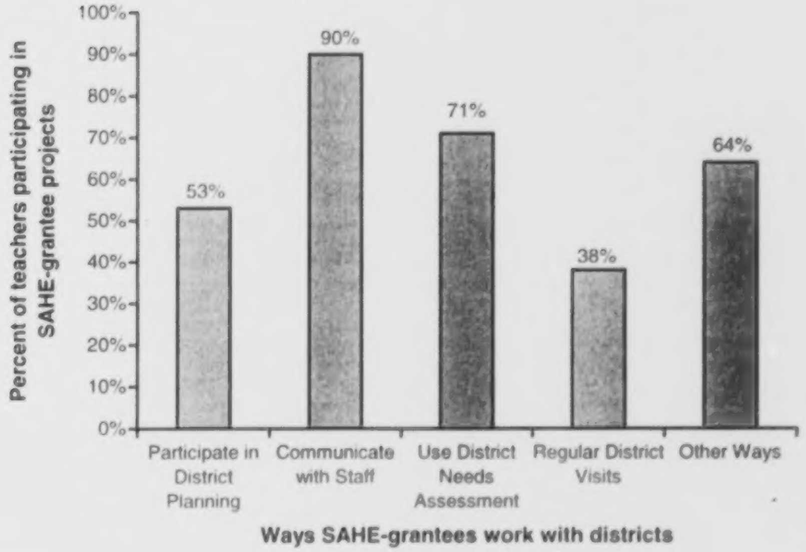
Working with Districts

We asked each SAHE-grantee project director if he or she worked with districts in any of the following ways: 1) participate in district planning, 2) communicate periodically with staff, and 3) rely on district needs assessments to plan their project. We also asked if districts conducted regular visits and observations of professional development activities provided by the SAHE grantees and whether the grantee worked with districts in other ways.

As indicated in Exhibit 6.17, many of the participating teachers are in projects whose directors report working with districts in each of these five ways. Ninety percent of participating teachers are in projects whose directors communicate periodically with district staff, 71 percent are in projects that rely on district needs assessments, 53 percent are in projects that participate in district planning, 38 percent are in projects whose directors report that districts visit and observe regularly, and 64 percent are in projects that work with districts in other ways.

EXHIBIT 6.17

Percent of Teachers Participating in SAHE-grantee Projects That Work with Districts in Different Ways (n=92)



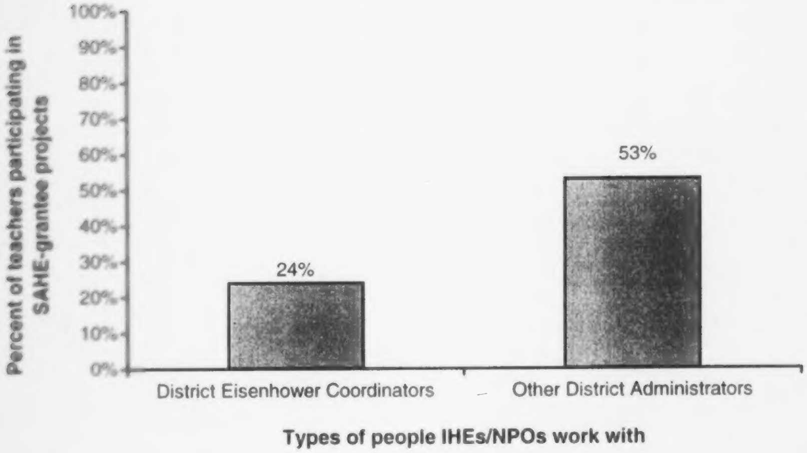
Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 53 percent of teachers participating in SAHE-grantee projects are in projects that work with their district by participating in district planning. Each bar and the number on top of it represent the percent of participating teachers for each category.

District Involvement in Planning, Implementing, or Monitoring

To measure the fourth component of coordination—involvement of district staff—we asked each project director if the district Eisenhower coordinator(s) and/or other district administrators are involved in planning, implementing, or monitoring the SAHE-grantee project. Responses, illustrated in Exhibit 6.18, indicate that 53 percent of participating teachers are in projects whose directors report working with non-Eisenhower district administrators in planning, implementing or monitoring the IHE/NPOs' Eisenhower project. Surprisingly, only 24 percent of participating teachers are in projects whose directors say they work with the district Eisenhower coordinator in these ways. However, more than half of participating teachers are in projects whose directors work with *other* district administrators. Working with district staff would seem to afford SAHE-grantee project directors the opportunity to become knowledgeable about and integrate district programs, standards, and assessments into the project; nevertheless, many do not seem to be doing this.

EXHIBIT 6.18

Percent of Teachers Participating in SAHE-grantee Projects in Which District Staff Are Involved in Planning, Implementing, or Monitoring Eisenhower-assisted Activities (n=92)



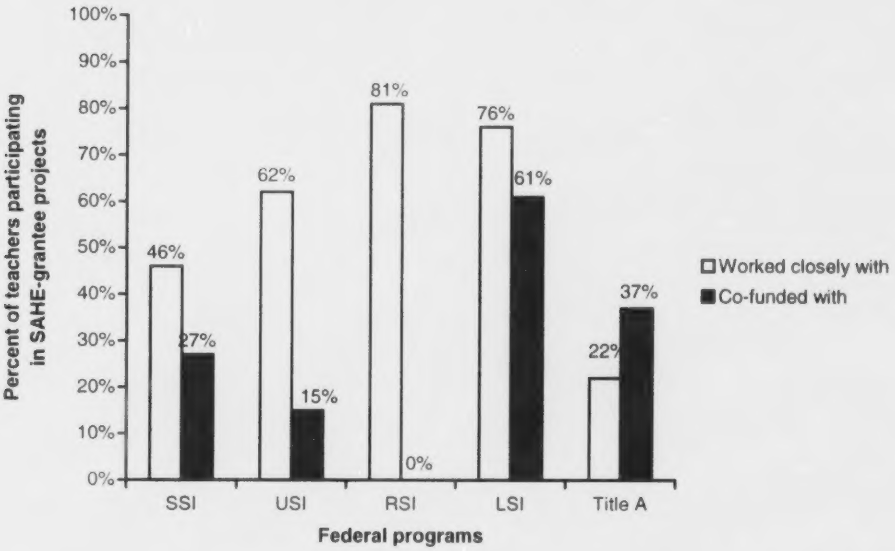
Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 24 percent of teachers participating in SAHE-grantee projects are in projects whose directors report that the district Eisenhower coordinator is involved in planning, implementing, or monitoring the project. Each bar and the number on top of it represent the percent of participating teachers for each category.

Co-funding

A final dimension of coordination is co-funding, or the extent to which SAHE-grantee projects coordinate funding with other programs operating in the districts with which they work. For a number of National Science Foundation and ED department programs (i.e., NSF's State Systemic Initiative (SSI), Urban Systemic Initiative (USI), Rural Systemic Initiative (RSI), and Local Systemic Initiative (LSI), and ED's Title I, Part A program), we asked each SAHE grantee if the program operated in the districts with which the IHE/NPO worked during the last year, and if the program supports professional development. We also asked whether the program co-funded professional development last year with the SAHE-grantee's project, and whether the program staff worked closely with the grantee's staff in the last year. Results in Exhibit 6.19 show that SAHE grantees do little co-funding with federal programs, although they report high levels of working with other programs. (Note: results reported for working closely with districts are contingent upon the program existing in the district in which the IHE/NPO is working; and co-funding results are contingent upon both the program's existence in the district and the program's inclusion of professional development.

EXHIBIT 6.19

Percent of Teachers Participating in SAHE-grantee Projects That Co-fund and/or Work Closely with Other Federal Programs (When the Program Operates in the District) (n varies)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that for those teachers participating in SAHE-grantee projects in projects that work with districts in which the SSI program is operating, 46 percent of participations are in projects that report working closely with the SSI program. Each bar and the number on top of it represent the percent of participating teachers for each category.

Eighty-one percent of participating teachers are in projects whose directors say they work closely with the RSI program staff. To a lesser extent, SAHE grantees work with staff from the LSI (76 percent of participating are in projects whose directors work with LSI staff), the USI (62 percent), the SSI (46 percent), and Title I, Part A (22 percent). However, while SAHE grantees work with staff of other programs, grantees often do not co-fund with them. No SAHE grantees co-fund with the Rural Systemic Initiative, and few co-fund with the USI (15 percent of participating teachers in projects located in states with USIs, where the USIs support professional development, are in projects that co-fund with the USI). Sixty-one percent of participating teachers in projects in districts with LSIs that support professional development are in projects that co-fund with the LSI. To a lesser extent, participating teachers are in projects that co-fund with Title A (37 percent) and the SSI (27 percent).

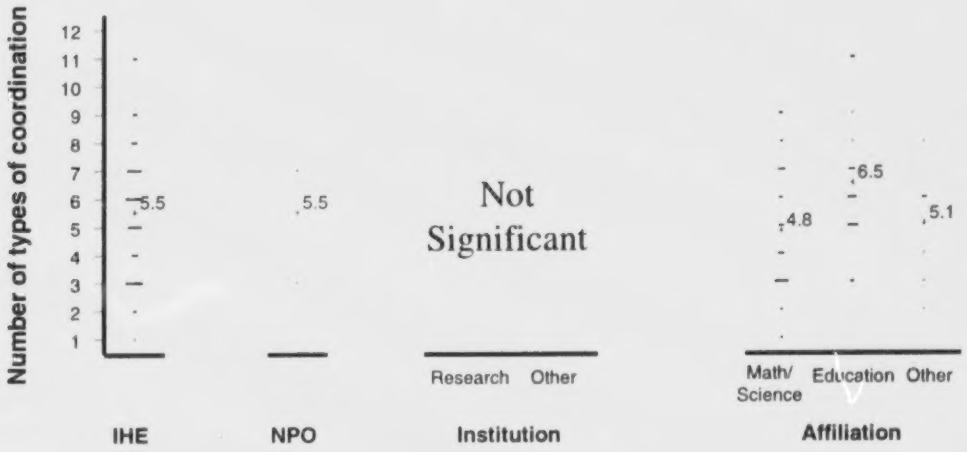
These results support the notion that many IHE/NPOs work with districts only after the IHE/NPO activity has been designed. In order for co-funding to occur, there would have to be more coordination in the design phase of the activity, and our evidence suggests that SAHE grantees design their activities independently of the district. Although many project directors report working with district administrators, this may occur primarily in the implementation phase, and thus not have an effect on the design or structure of the activities.

Overall Coordination with Districts

We combined all five of these scales to create a coordination composite measuring the extent of coordination that each SAHE grantee has with districts. There are 12 possible types of coordination, so the scale ranges from 0 to 12.[14] As Exhibit 6.20 indicates, projects in "other" departments rarely have more than six coordination strategies; projects in education departments have between 3 and 11; and projects in mathematics/science departments have from 1 to 9 types of coordination. Exhibit 6.20 also shows that the level of coordination does not vary significantly by institution type. However, SAHE-supported IHE projects in education departments have significantly more coordination than IHE projects in mathematics or science departments (6.5 types compared to 4.8). These findings offer more support for the notion that education departments are more closely tied to districts than are mathematics or science departments.

EXHIBIT 6.20

Number of Types of Coordination of the SAHE-grantee Project with Districts, Overall and by Institution Type and Departmental Affiliation (n=92)



	Significant Pairwise Contrasts
Departmental Affiliation	Mathematics/Science vs. Education

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first distribution shows that on average, teachers in SAHE-grantee projects are in projects that report having 5.5 of a possible 12 types of coordination with districts. Each dot represents one IHE/NPO project. As the number of IHE/NPO projects at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

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[14] The extent to which IHE/NPOs work closely with federal programs is not part of our overall coordination composite because the intent of the composite is to measure overall coordination efforts with districts, not federal- or state-level coordination.

Overall, our survey data indicate that districts and SAHE grantees work together in some ways, *but not others, and that district goals and standards* are not always integrated into SAHE-grantee activities. This conclusion is supported by data from our interviews with a number of SAHE-grantee project directors that we conducted in conjunction with our in-depth case studies. For example, in Ohio, a school district and partnership schools in the city are involved in the SAHE-sponsored IHE professional development activity, which focuses on providing science materials and equipment to science teachers. The university provides direction, coordination, and evaluation of the project; facilitates the assembly, organization, and storage of teaching kits, hardware, and software; and provides technical assistance. The university also is involved in planning, guiding teachers' academic progress, preparing and grading exams, and lending and hauling specialized equipment for demonstrations. The local school districts provide the use of their library and classrooms, audiovisual equipment, utilities, and janitorial service for several classroom sessions. All cooperating schools also agreed to provide $150 per teacher-participant for instructional materials to be used with their students in local classrooms. In addition, one of the teachers from the district is involved in every planning session and reports personally to the superintendent. The local county Board of Education provides courier service and some clerical help and time for communications, recruitment, and supervision of teacher selection. Despite this multi-level collaboration, the IHE reports that their project does not relate to the professional development goals of the district, and in fact, the IHE is unfamiliar with the district's professional development goals.

Similarly, in Texas, a SAHE-sponsored IHE project director collaborates with district and federal programs, but reports that district standards and assessments have little effect on the project's professional development activities. The project's primary goal is to create a support system to increase implementation of the national standards in science and math. The superintendent or assistant superintendent of the district must sign off on the project and agree that their teachers will participate. The project is coordinated with the USIs in the districts that the project serves, and there is collaborative planning with the districts' science coordinators, three USI directors from two different districts, a grant coordinator from one of the districts, and professors from the college. The Eisenhower and USI directors volunteer time to work with each other. Mentor teachers also give input into the project development. The IHE project director reports that she works very closely with the district. She spends approximately 200 hours in classrooms each year doing follow-up. Despite this level of coordination and collaboration, the director reports that district assessments, standards, or indicators do not affect the design or implementation of the program.

Thus, if the goal of requiring SAHE grantees to develop cooperative agreements with districts and to work closely with districts in implementing their projects is to foster collaboration in the design of professional development activities, alignment with district standards and assessments, and integration with district programs and reforms, IHEs and districts do not seem to be meeting the goal. While IHE/NPOs report working closely with districts on several activities, they report *not* working closely on other key dimensions, such as co-funding and working with the district Eisenhower coordinators. While the independence of IHE/NPOs may serve an important function in allowing them to provide new knowledge and innovative approaches to teaching, coordination with districts might be encouraged in specific areas where it may benefit both IHE/NPOs and districts, such as in co-funding and targeting.

Implementing the Vision: IHE/NPO Procedures for the Continuous Improvement of Professional Development Activities

Section Findings

- *For SAHE grantees in states or districts with indicators, state indicators have a much greater effect on SAHE grantees than district indicators do.*
- *About two-thirds of SAHE grantees conduct needs assessments of teachers; the most popular methods of conducting these needs assessments are teacher surveys and informal conversations with teachers.*
- *Almost all SAHE grantees evaluate their activities. Of those that evaluate, almost all use teacher surveys as a method of evaluation; the majority also use counts of teacher participations and observations of teachers; less than a third use student achievement as an evaluation measure.*
- *Research/doctoral universities use fewer continuous improvement methods than other types of IHEs, and IHE projects housed in mathematics or science departments use significantly fewer continuous improvement methods than IHE projects housed in either education or other (i.e., non-mathematics, science, or education) departments.*

In addition to alignment and coordination, another method of shaping professional development activities involves the use of indicators, needs assessments, and evaluations to help design and implement activities. As we noted earlier, the legislation's overall purposes apply to SAHE grantees; the law calls for SAHE grantees to provide professional development that "creates an orientation toward continuous improvement throughout the school" (Section 2002(2)(F)). The law requires that SAHE grantees establish performance indicators (Section 2208(a)(2)), conduct an assessment of teachers needs (Section 2208(b)(1)), and report to the state on the progress toward meeting the indicators (Section 2401(b) and Section 2208(d)(1)(G)). These provisions reflect the "continuous improvement" paradigm that the federal government has adopted, embodied by the Government Performance and Results Act. Research has suggested that such continuous improvement methods are important for high-quality professional development. The quality of professional development increases when teachers and providers are held accountable for outcomes of professional development (Loucks-Horsley et al., 1998) and when professional development is evaluated based on teacher and student outcomes (Guskey, 1997).

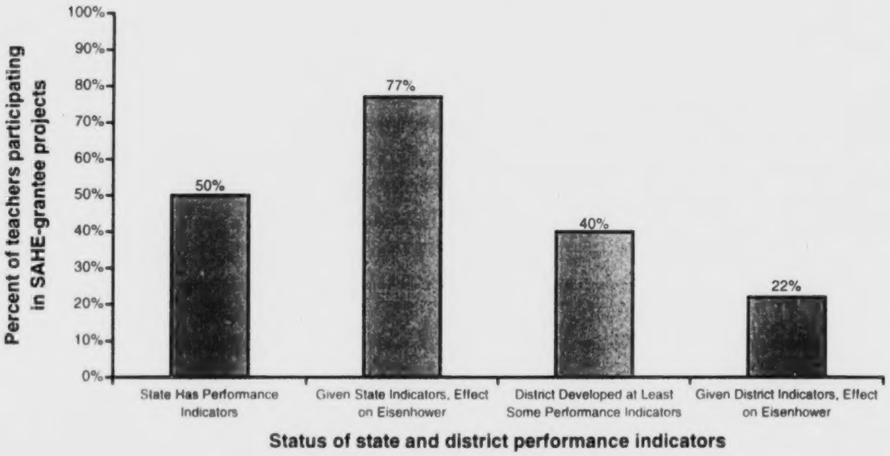
We examined SAHE-grantee continuous improvement efforts by asking the project directors about their use of indicators, needs assessments, and evaluations in the design and implementation of their professional development activities.

Presence and Use of Performance Indicators

We asked SAHE-grantee project directors whether they are aware of any performance indicators for professional development set by the state and/or district, and if so, whether these indicators affect their Eisenhower projects. Exhibit 6.21 illustrates that 50 percent of teachers participating in SAHE-grantee projects are in projects whose directors report being aware of state performance indicators; of these, 77 percent are in projects whose directors also report that the Eisenhower project is affected by the state indicators. Forty percent of participating teachers are in projects that work with districts that have performance indicators; of these, only 22 percent are in projects whose directors say that the indicators affect the project.[15] Thus, state indicators seem to have more effect on SAHE-grantee projects than do district indicators. This is consistent with findings reported in Chapter 5, which show that districts are also more affected by state than district indicators, and with findings reported earlier in this chapter, which show that state standards and assessments play a larger role in project design than district standards or assessments.

EXHIBIT 6.21

Percent of Teachers Participating in SAHE-grantee Projects, by Status and Effect of District and State Performance Indicators on the Project (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 50 percent of teachers participating in SAHE-grantee projects are in projects that report that their state has performance indicators. Each bar and the number on top of it represent the percent of participating teachers for each category.

In our case-study interviews, an IHE project director in Kentucky said that state assessments have affected their projects more than district assessments, because schools in the state are held accountable for meeting the state goals, and the IHE projects aim to help teachers in this effort. Also, the IHE director said that district-level indicators do not affect the Eisenhower project directly, because the project works with many districts. Nevertheless, district indicators may have an indirect influence, because they are usually in line with the state indicators. An IHE project director in Texas supported this view, reporting that district assessments have not affected the design of the Eisenhower program because their project is based on the national standards.

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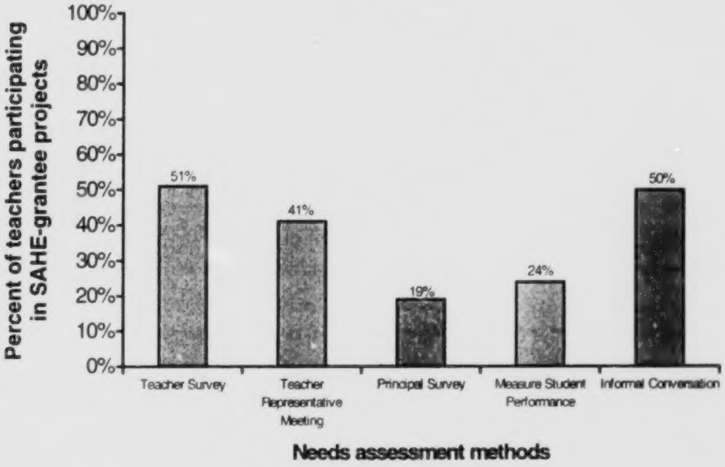
[15] This number reflects SAHE grantees that report that either some, most, or all of the districts that they work with have performance indicators.

Assessing the Needs of Teachers

Another dimension of continuous improvement is assessing teachers' needs in order to identify potential areas for improvement. About 66 percent of participating teachers are in projects that say they formally assess teachers' needs for professional development (data not shown). We asked SAHE-grantee project directors how they assess teachers' needs for professional development. Options were 1) with a survey of teachers, 2) with meetings of teacher representatives, 3) with a survey of principals or department chairs, 4) with measures of student performance, and 5) with informal conversations. Exhibit 6.22 shows that the most common methods are surveying teachers (51 percent of participating teachers are in projects that use this method) and informal conversations (50 percent). Meetings with teacher representatives (41 percent) are less frequent. Less than a quarter of participating teachers are in projects that indicate that they use measures of student performance (24 percent) or surveys of principals or department chairs (19 percent) to assess teachers' professional development needs. Thus the most common source of needs assessment information is teachers. While it is important to consider teachers' perceptions of their own needs as well as their students' needs, it may also be useful to combine this with information from other sources, such as classroom observations.

EXHIBIT 6.22

Percent of Teachers Participating in SAHE-grantee Projects That Use Different Strategies to Assess Teachers' Professional Development Needs (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 51 percent of teachers participating in SAHE-grantee projects are in projects that report using teacher surveys as a strategy for assessing teachers' professional development needs. Each bar and the number on top of it represent the percent of participating teachers for each category.

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Compared to the SAHE-grantee project directors, district coordinators report much higher levels of needs assessments of every kind (see Exhibit 5.12 in Chapter 5). There are several possible explanations for the higher levels of needs assessment in districts. One explanation is that, as shown in Exhibit 6.17, 65 percent of participating teachers are in projects that rely on district needs assessments to design their professional development program, rather than designing their own. Other reasons may be that districts have better access to teachers than do SAHE grantees, making assessment methods such as "informal conversations" much easier to implement. Districts can more easily identify the pool of teachers for which the professional development will be designed, whereas SAHE grantees may be working with several districts and it may not be clear from where participants will be drawn. Further, many IHE-sponsored activities are college courses, which may be designed to fulfill needs of teachers who are students at the college, rather than to fulfill the needs of teachers in districts with which the IHE may be working. Also, college professors may rely on theory and research to identify teachers' needs, rather than surveying teachers themselves.

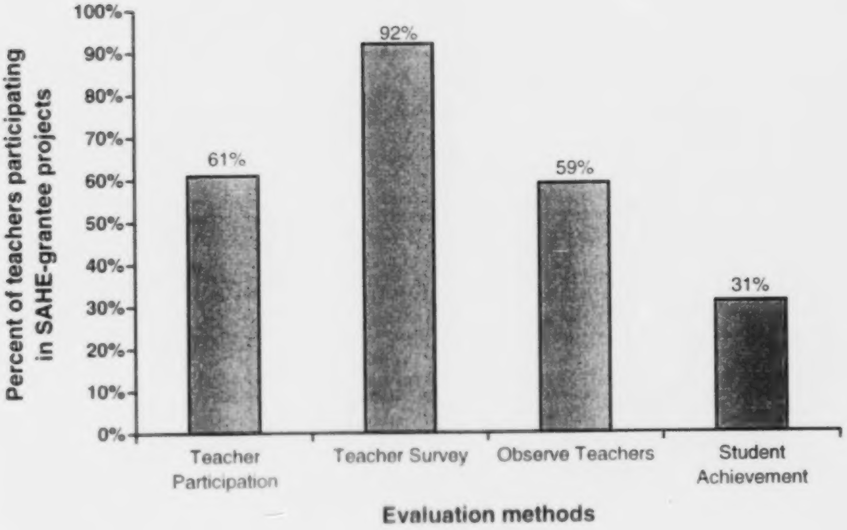
Evaluating Professional Development Activities

The third component of continuous improvement that we measured is evaluation of the professional development activity. We asked SAHE grantees if they evaluate their Eisenhower-assisted professional development; ninety-three percent of participating teachers are in projects whose project directors say that they evaluate these activities. We then asked SAHE grantees how they evaluate their professional development. Alternatives include 1) by the number of teachers participating in professional development, 2) with a teacher satisfaction survey, 3) with observations of teachers, and/or 4) with student achievement. As Exhibit 6.23 illustrates, the most common method of evaluation is a teacher satisfaction survey, which almost all SAHE grantees use; ninety-two percent of participating teachers are projects that use surveys. To a lesser extent, SAHE grantee project directors report using a count of the number of teachers who participate (61 percent of participating teachers are in projects that use this method) and observations of teachers (59 percent) as methods for evaluating their Eisenhower-assisted professional development activities. The least common method of evaluation is using student achievement as a measure of the professional development activity; 31 percent of participating teachers are in projects that use this method.

One IHE project director in Texas offered a possible explanation for the relatively infrequent use of student achievement as a method of evaluating professional development. She explains that science is addressed infrequently on state tests and therefore the only regular indicator of student achievement in science that is available is student grades. This may explain why student achievement measures are not used for science, but it would not explain why they are not used for mathematics. It may be that IHE/NPOs do not use student achievement measures because of the complexity involved in identifying comparable measures over time and separating the effects of professional development from other effects. Using student achievement to determine effects of professional development is a complex, long-term undertaking involving longitudinal studies of teachers and students; SAHE grantees may not have the resources or capacity to launch such evaluations. Given time, expertise, and resource constraints, a more appropriate method of evaluation is for SAHE grantees to evaluate their professional development activities based on the characteristics of high quality that we have shown in this report to be indicative of effective professional development. For example, SAHE grantees could document the duration of their activities, and the opportunities for active learning and collective participation. In addition, SAHE grantees might evaluate the extent to which participants gain the intended knowledge and skills or show improvements in classroom teaching.

EXHIBIT 6.23

Percent of Teachers Participating in SAHE-grantee Projects That Use Different Methods for Evaluating Activities (n=92)



Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first bar shows that 61 percent of teachers participating in SAHE-grantee projects are in projects whose director reports that counts of teacher participation are used as a method for evaluating Eisenhower-assisted professional development activities. Each bar and the number on top of it represent the percent of participating teachers for each category.

Overall Continuous Improvement

Taken together, indicators, needs assessments, and evaluation strategies can be components of a process of continuous improvement in the design of professional development. To examine whether SAHE grantees' use of continuous improvement methods differs significantly by institution type or affiliation, we created scales for indicators, needs assessments, and evaluation, rescaled each to have a range from 0 to 1, then created an additive composite of all three scales, with a range of 0 to 3. Exhibit 6.24 shows the results for this continuous improvement composite. It indicates great variation in the extent to which SAHE grantees use continuous improvement strategies. The data also indicate that nonresearch/doctoral-granting institutions use significantly more continuous improvement strategies than do research/doctoral-granting institutions. As described earlier, research/doctoral-granting institutions may be more likely to design their Eisenhower projects to reflect current research agendas of the faculty, and therefore may be less likely than other types of colleges and universities to work with districts to provide activities tailored to the needs of their teachers, which would require more needs assessments and evaluation. Our data also show that IHE projects housed in education departments engage in significantly more continuous improvement

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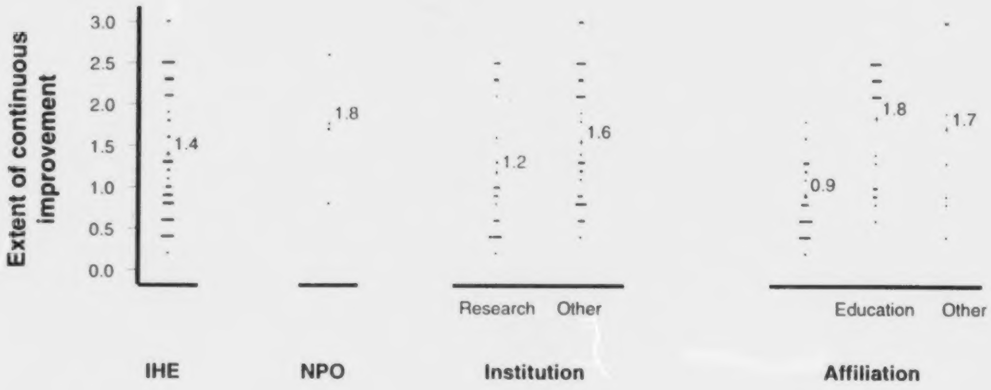
activities than IHE projects housed in mathematics or science departments. As we discussed earlier in the chapter, professors in education departments may have closer relationships with districts than mathematics or science professors. This in turn may increase their access to teachers in the district, for purposes of getting feedback on how professional development activities might apply to district indicators, and for gaining access to teachers to assess needs and follow-up with evaluative measures. Also, education professors are more likely than mathematics or science professors to be social scientists and to use social science methods upon which the process of continuous improvement is based.

EXHIBIT 6.24

Extent of SAHE-grantee Continuous Improvement Efforts, Overall and by Institution Type and Departmental Affiliation (n=92)



	Significant Pairwise Contrasts
Departmental Affiliation	Mathematics/Science vs. Education; Mathematics/Science vs. Other

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
How to read this exhibit: The first distribution shows that teachers in SAHE-grantee projects are in projects that report an average continuous improvement score of 1.4, where zero indicates no continuous improvement efforts and three indicates the largest extent of continuous improvement efforts. Each dot represents one IHE/NPO project. As the number of IHE/NPO projects at one data point (or value) increases, the dots form a horizontal line that increases in length. Each distribution represents the distribution for that particular category. The number to the right of the distribution is the mean.

Summary: Continuous Improvement

Our data from SAHE-grantee project directors show that grantees are much more likely to use state indicators than district indicators. This parallels our finding reported earlier in this chapter that SAHE-grantee projects are more likely to be aligned with state than district standards and assessments. These findings may indicate that the SAHE competitive-proposal process helps to ensure that SAHE-grantee-provided professional development is linked to statewide reform. But the results also imply that the law's requirements that SAHE grantees develop cooperative agreements and work closely with the district do not translate into the use of district standards, assessments, and indicators. Further, we find that while most SAHE-grantee project directors conduct needs assessments and evaluations, these processes typically are based on some form of feedback from

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teachers, such as surveys or informal conversations. Observations of teachers or measures of student achievement, which may be more objective ways of assessing needs and evaluating outcomes, are less commonly used for these purposes. This may, in part, be due to the difficulty of obtaining these measures, especially student achievement. Finally, analysis of our continuous improvement composite indicates that projects in research/doctoral institutions and mathematics/science departments use continuous improvement processes significantly less than other institutions and education departments, respectively.

DIFFERENCES IN SAHE-GRANTEE PROJECTS BY INSTITUTION TYPE AND DEPARTMENTAL AFFILIATION

Throughout this chapter, we have examined whether the features and management of Eisenhower-assisted professional development differ by type of institution and departmental affiliation. With respect to *type of institution*, we find that, compared to nonresearch/doctoral-granting institutions, research/doctoral-granting institutions:

- have significantly more collective participation in their primary activity;
- are less aligned with state and district standards and assessments; and
- use fewer continuous-improvement methods.

With respect to *departmental affiliation*, our data indicate that, compared to projects in mathematics/science departments, projects in education departments:[16]

- are more likely to be reform rather than traditional;
- sponsor professional development activities that span a longer time period;
- engage in more types of coordination with the district; and
- use more continuous improvement efforts ("other" departments also use significantly more continuous improvement efforts than mathematics or science departments).

Thus, our data suggest that project directors who are affiliated with education departments design and implement Eisenhower professional development projects that are superior to those designed by directors associated with mathematics or science departments, on a number of dimensions.

Further, we find some evidence of interactions between institution type and departmental affiliation.

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[16] Although a project that is housed in a particular department may be administered collaboratively by the school of education and the college or school in which the mathematics/science department resides, our study focuses on the departmental affiliation of the project director.

- Projects in mathematics/science departments have high content focus regardless of the type of IHE they are in, while projects in education and other departments have a high content focus only if they are in research/doctoral universities.
- Projects in education departments have many opportunities for active learning when housed in research universities, but only a moderate number when housed in nonresearch universities. The opposite is true for mathematics/science department projects—they have more active learning opportunities in nonresearch than research universities.
- Projects in "other" departments have a high number of active learning opportunities regardless of the type of institution they are in.

Opportunities for active learning and number of contact hours are greater in education departments, but only in education departments at research/doctoral-granting institutions. This may indicate that education professors in research institutions, compared to other institutions, are more likely to be familiar with recent professional development literature that emphasizes the importance of active learning opportunities and extended contact hours. Further, education professors in research universities are the primary source of research in professional development, and are the primary promoters of reforms in the quality of activities; therefore it is not surprising that these professors are the ones most likely to direct projects with high-quality structural and core features. This also suggests a potentially important distinction. In general, perhaps due to the goals that a department that trains teachers has in common with the school district that it serves, professors associated with education departments may have a closer relationship with districts than mathematics or science professors. This closer relationship creates a natural communication that permits closer collaboration, which in turn may foster more targeting, coordination, and continuous-improvement efforts. This reasoning may also help to explain why research universities score lower in continuous improvement and alignment than other types of institutions. IHEs that have larger teacher education programs, which are more likely to be institutions that grant only bachelor's and master's degrees, are likely to have closer ties to local school districts. These ties facilitate the sharing of information and collaboration that is necessary for continuous-improvement and alignment efforts. If research/doctoral-granting universities are less likely to have these links to the district, projects in these universities would be less likely to implement continuous-improvement and alignment strategies. Also, project directors in research universities are more likely to have their own research agendas that help shape the activities that they design, whereas their colleagues at nonresearch universities may be more free to be responsive to the district's needs.

The high degree of content focus of projects in mathematics/science departments in either type of institution is not a surprise, given that mathematics/science departments usually do not include pedagogy and processes in their curriculum, as education departments do. The higher content focus of projects in education and other departments in research universities, compared to projects in nonresearch universities, may indicate that project directors in nonresearch institutions need more knowledge about the importance of content focus in professional development activities.

THE RELATIONSHIP OF SAHE-GRANTEE MANAGEMENT TO FEATURES OF PROFESSIONAL DEVELOPMENT

So far in the chapter we have examined the features of SAHE-grantee activities, and how SAHE grantees manage and operate their professional development activities. We now look at the associations among these variables, to examine how they work together and affect each other. Exhibit 6.25 shows the relationships among the implementation and quality variables that we discuss in this chapter. (For a more detailed presentation of the results, see Appendix H.) All reported coefficients are standardized path coefficients, which represent the influence of one variable on another. The range in values for path coefficients is generally between –1 and 1, and greater absolute values represent stronger relationships. All paths shown are statistically significant at the .05 level.

The model is designed to reflect an implied causal structure: variables on the far left are considered to be exogenous variables, or external to the system, since they are preconditions and are not manipulable (except to the extent that grants can be targeted to particular types of institutions or departments within institutions). Alignment and coordination are implementation variables that are posited to affect structural and core features of professional development activities both directly and indirectly through increased continuous-improvement efforts.

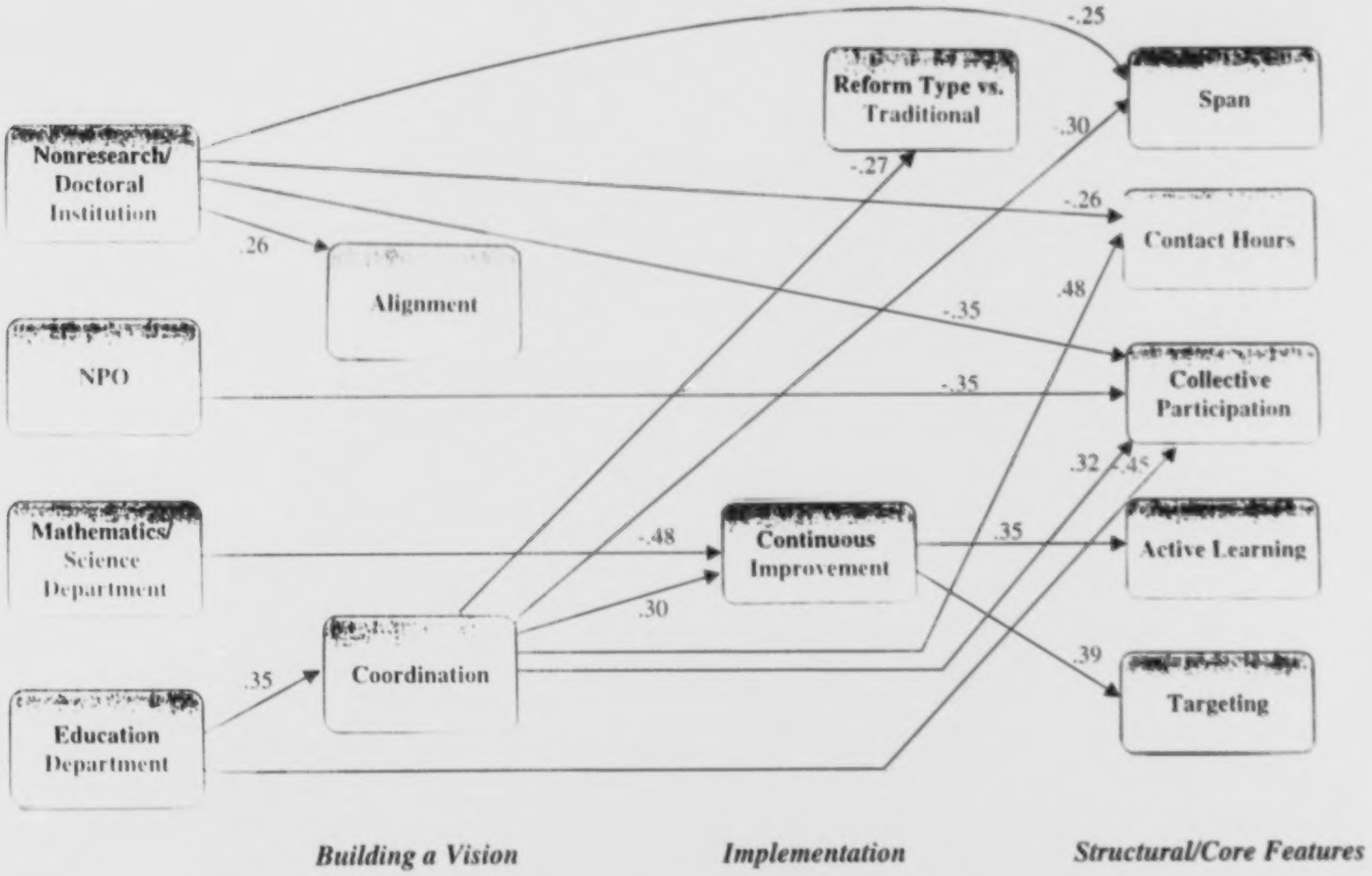
Exhibit 6.25 suggests that it is in part through coordination with districts that education departments outperform mathematics/science departments on many dimensions of professional development. Coordination with the district is associated with several structural and core features. Projects that coordinate with districts are less likely to have reform activities or activities with long time-spans, but more likely to have activities with collective participation and a greater number of contact hours. This might suggest that if an activity is coordinated with the district, it might be planned around the school year, and occur during breaks or the summer, which would require a shorter span of time, but allow more contact hours. One would also expect more collective participation, since the project director in the education department is working closely with the district, perhaps planning professional development to meet the needs of particular groups of teachers or schools.

The model also indicates that SAHE grantees that engage in coordination make greater use of continuous improvement strategies (i.e., indicators, needs assessments, and evaluation), and in turn are more likely to offer more active learning opportunities and target specific groups of teachers, perhaps in response to the needs assessments and evaluations provided by teachers. Alternatively, SAHE grantees inclined to practice coordination and continuous-improvement efforts may already be reform-minded, and thus inclined to design their activities with many active learning strategies, and to reach teachers of at-risk students.

In contrast to education departments, nonresearch/doctoral-granting institutions, NPOs, and mathematics/science departments have no positive paths, and some negative paths, to desirable characteristics of professional development. In particular, mathematics/science departments are much less likely to engage in continuous improvement strategies, and thus have projects with fewer opportunities for active learning and less targeting. Further, although our earlier analysis showed that nonresearch/doctoral-granting institutions are more likely than research institutions to align their activities with state and district standards and assessments, alignment does not prove to have any associations with continuous improvement or quality features.

EXHIBIT 6.25

RELATIONSHIP OF SAHE-GRANTEE MANAGEMENT TO FEATURES OF PROFESSIONAL DEVELOPMENT


Nonresearch/ Doctoral Institution
NPO
Mathematics/ Science Department
Education Department
Alignment
Coordination
Reform Type vs. Traditional
Continuous Improvement
Span
Contact Hours
Collective Participation
Active Learning
Targeting
-.25
.30
-.27
-.26
.26
.48
-.35
-.35
.32
.45
-.48
.35
.30
.35
.39
Building a Vision
Implementation
Structural/Core Features

317

318

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This selected analysis of our SAHE-grantee model illustrates the importance of coordination and continuous improvement in determining the structural and core features of professional development activities. These results suggest that the emphasis of the Title II legislation on SAHE-grantee coordination with districts is well-placed, considering the strong relationship that coordination has with the quality of professional development, and with continuous-improvement efforts. Similarly, the law's attention to continuous-improvement efforts in the use of indicators, needs assessment, and evaluation is also well-supported by our findings. But, as reported earlier in this chapter, we do not find much evidence of coordination as is called for in the law. Greater compliance with the law might improve the overall quality of the professional development activities that SAHE grantees provide.

It would be helpful to identify the factors that facilitate coordination and continuous improvement efforts in education departments, and how these efforts translate into higher quality professional development. This information would better enable us to apply these principles and lessons to professional development provided by other departments, and by school districts and schools.

SUMMARY AND CONCLUSIONS

In this chapter, we identified the types of SAHE grantees that provide professional development through the Eisenhower program; described the structural and core features of the professional development activities; the alignment, coordination, and continuous-improvement efforts of SAHE grantees; and examined how these characteristics might be explained by the type of institution and the departmental affiliation of the project director. Several of these findings have implications for the Eisenhower program.

First, we find that while SAHE-sponsored IHE/NPOs tend to offer traditional types of professional development, the activities have many contact hours and span many months. Second, SAHE-sponsored IHE/NPOs generally provide activities with strong content focus and many opportunities for active learning. These characteristics all represent characteristics of high-quality professional development, as posited in the literature and supported by our data in Chapter 3. Although there is variation in the quality of SAHE-grantee projects, and they have few opportunities for teachers' collective participation, in general the activities they provide support Title II's goal of providing "sustained and intensive" high-quality professional development activities. The SAHE competitive award process may foster high-quality projects through establishing criteria, requiring projects to have particular characteristics, and monitoring to ensure implementation; but we do not have sufficient data on these SAHE-sponsored competitions to examine the extent to which these factors affect project characteristics and operations.

Third, SAHE-grantee project directors report that they target teachers of special populations of students to participate in professional development activities, but our data from teachers, reported in Chapter 3, show that the actual participation of these groups of teachers in IHE activities is low when compared to participation levels in district-sponsored activities. Given Title II's emphasis on targeting and recruiting teachers of diverse students, it may be desirable to work with IHE/NPOs to improve their methods for targeting and recruiting these teachers.

Fourth, SAHE grantees are less likely to co-fund and work with the Eisenhower coordinator than they are to communicate or work closely with other district staff. Coordination with the district, which includes both co-funding and working with the district in many other ways, is one of the most important variables in our model of quality professional development. Also, despite high levels of coordination in some areas, SAHE-grantee projects tend not to be aligned with district standards and assessments or use district indicators; they respond more to state standards and indicators. As we suggested earlier, this may be because SAHE grantees sometimes coordinate with districts in the implementation of activities, but not in their development and design. It would be helpful to understand the mechanisms through which coordination affects the quality of professional development, so that we could draw lessons about what types of interactions are useful for shaping high-quality professional development, and how they work. Perhaps it would be helpful to provide more specific guidelines, emphasis, and/or training for particular types of coordination that have been shown to be associated with the provision of high-quality professional development.

Fifth, as with districts, SAHE grantees tend to use teacher reports and surveys rather than classroom observation or student achievement measures to assess needs and evaluate outcomes. Given the complexity of using student achievement to measure the effects of professional development, it may be desirable to emphasize in the legislation the importance of evaluating the quality of professional development activities based on the activities' structural and core features, as described in the literature and in this evaluation.

Finally, our analyses of differences by institution type and departmental affiliation indicate that, while projects in mathematics/science departments have a high content focus, education departments do better than mathematics/science departments on several dimensions of quality and implementation. As our model illustrates, this is probably due in large part to the better coordination that education departments have with districts, and their superior continuous-improvement efforts. It would be informative to get a more in-depth sense of the process of coordination that take place between education departments and districts, and how continuous-improvement efforts are integrated into the design and implementation of their professional development activities. This would help us to identify the specific factors and processes that are most influential in shaping high-quality professional development activities. In addition, it might be useful for the law to give more emphasis to the desirability of having mathematics and science departments collaborate with education departments in the design and coordination of their Eisenhower project.

CHAPTER 7

CONCLUSIONS AND LESSONS FOR THE EISENHOWER PROGRAM

This is the second report of the National Evaluation of the Eisenhower Professional Development Program, Part B (Title II of the Elementary and Secondary Education Act). The first report was based on six exploratory case studies of school districts conducted during the first months of the evaluation (Birman, Reeve, & Sattler, 1998). The purpose of that report was to obtain an initial description of the program and the issues that it faced in different local contexts. This second report describes the current status of the program, based on data from national probability samples of districts, State Agency for Higher Education (SAHE) grantees, and teachers, as well as on data from 10 in-depth case studies in five states. The third report of the evaluation, to be issued in early 2000, will augment the cross-sectional results reported here with a longitudinal account of teachers' experiences in Eisenhower and other professional development activities and changes in their teaching practices.

The Eisenhower Professional Development Program is the U.S. Department of Education's largest investment that is solely focused on improving the quality of teaching practice. Part B of the Eisenhower Professional Development program, with a 1999 appropriation of approximately $335 million, provides funds through states to school districts and institutions of higher education and nonprofit organizations. These funds primarily support professional development in mathematics and science.

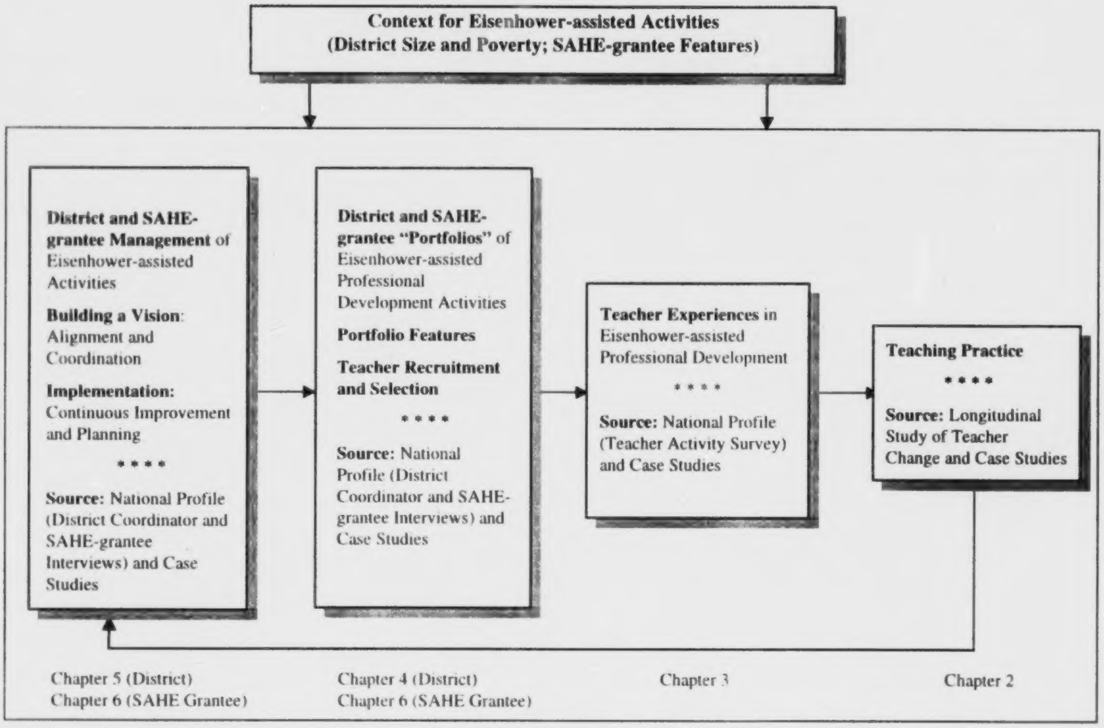
In its 1994 reauthorization of the program, Congress made explicit that Eisenhower-assisted professional development activities should be designed to improve teacher practice and, ultimately, student performance. The law also places particular emphasis on serving teachers in schools with high poverty rates. Furthermore, the reauthorized Eisenhower program embodies policymakers' intention that the program support systemic education reform and deeper learning among teachers.

In the analyses conducted for this report, we examine the extent to which these intentions have been achieved. Our conclusions about the effectiveness of the Eisenhower program are divided into four main parts. First, we ask, what is the nature of current classroom teaching practices in mathematics and science, and what directions does current classroom practice suggest for professional development (Chapter 2)? Second, what evidence do we find that teachers experience high-quality professional development in Eisenhower-assisted activities (Chapter 3)? Third, what evidence do we find that districts develop their portfolios of professional development activities and manage and operate their projects in ways consistent with the intent of the legislation (Chapters 4 and 5)? Fourth, how well do SAHE grantee projects perform with respect to the requirements and intent of the legislation (Chapter 6)?

These major areas correspond to the main elements in our conceptual framework for the evaluation (see Exhibit 7.0).

EXHIBIT 7.0

Conceptual Framework for This Evaluation


Context for Eisenhower-assisted Activities
(District Size and Poverty; SAHE-grantee Features)
District and SAHE-grantee Management of Eisenhower-assisted Activities
Building a Vision: Alignment and Coordination
Implementation: Continuous Improvement and Planning
* * * *
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
District and SAHE-grantee "Portfolios" of Eisenhower-assisted Professional Development Activities
Portfolio Features
Teacher Recruitment and Selection
* * * *
Source: National Profile (District Coordinator and SAHE-grantee Interviews) and Case Studies
Teacher Experiences in Eisenhower-assisted Professional Development
* * * *
Source: National Profile (Teacher Activity Survey) and Case Studies
Teaching Practice
* * * *
Source: Longitudinal Study of Teacher Change and Case Studies
Chapter 5 (District)
Chapter 6 (SAHE Grantee)
Chapter 4 (District)
Chapter 6 (SAHE Grantee)
Chapter 3
Chapter 2

In the following section, we briefly review the data on which our evaluation is based. Then, we turn to the main conclusions and implications of the study.

STRENGTHS OF THE DATA

Before considering the findings of the National Evaluation of the Eisenhower Program, it is important to take stock of the quality of the data on which the findings rest. The data set has a number of important strengths. First, our descriptions of the nature and quality of professional development provided through the Eisenhower program are based on national probability samples, each with an excellent response rate. The national probability sample of district programs and SAHE grantees has an 88 percent response rate for district program coordinators and 87 percent for SAHE grantees. The national probability sample of teachers who participated in Eisenhower professional development activities has a response rate of 72 percent. The 72 percent response rate is especially high when considering the multistage process necessary to complete the sample.[1]

Second, the two probability samples are complementary. Data from our telephone interviews with district program coordinators and SAHE-grantee project directors are backed up by teacher participant accounts of what they experienced and its quality.

Finally, we have taken a number of steps to maximize the validity and reliability of the national survey data. For example, although the telephone interview and teacher survey data are based on self-reports, most of the data represent an accounting of behaviors, not direct judgments of quality that might be more likely biased in a positive direction. In addition, the survey results are cross-validated through case study data that are rich in potential to explain the descriptive statistics and path analyses from the surveys.

The three strands of the evaluation are designed to produce an integrated portrait of the Eisenhower program from many perspectives. Because the evaluation involves a variety of research methods and has collected data from groups of individuals who view Eisenhower-assisted activities from different vantage points, it is able to provide an accurate description of program-funded activities and analyses of the features of these activities and their effects on teacher practice.

The data we analyze in this report do not provide direct estimates of changes in teaching practice over time. Our conclusions about the effectiveness of Eisenhower-assisted professional development are based on teachers' reports of the extent to which participation enhanced their knowledge and skills and improved their teaching. Data from the second and third waves of our longitudinal study, to be examined in our third report, will provide additional information on teacher change.[2]

None of our analyses address directly how teacher participation in Eisenhower professional development leads to gains in student achievement. The work reported here, however, is not completely divorced from student achievement. The characteristics of professional development on which project directors and teacher participants reported in the surveys are carefully grounded in the available literature on professional development and student achievement. To the extent that the Eisenhower program provides professional development with characteristics identified as effective in the literature, we conclude that they are of high quality, and we tentatively infer that they should lead to benefits for students.

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[1] District coordinators and SAHE-grantee project directors had to submit the complete list of professional development activities provided during the prior year and the number of participants. Two activities were selected from each district with probability in proportion to size, and from those, complete rosters of teachers were collected from which two teachers were randomly selected and surveyed.

[2] We also took a number of steps to maximize the validity and reliability of the evaluation's national survey data. For example, most of the survey questions ask teachers and administrators to provide an accounting of behaviors, not direct judgments of quality that might be more likely to be biased. The substantial variation in the responses teachers and district administrators provided to these behavioral items, as well as the consistency in teacher and district administrator responses, tends to bolster our confidence in the validity of the data.

CURRENT TEACHING PRACTICES IN MATHEMATICS AND SCIENCE

The first analyses presented in this report focus on what we have learned from the baseline wave of our longitudinal survey about teachers' classroom practices in mathematics and science at the elementary, middle, and high school levels. The data for these baseline analyses, which are presented in Chapter 2, are from teachers in 30 schools, across 10 districts in five states. Teachers reported on the content they taught and their pedagogical practices for the 1996-97 school year. In addition, as part of our case studies, we conducted classroom observations of two teachers in each of the 30 schools.

These data allow us to identify weaknesses in classroom practices that might appropriately be addressed by Eisenhower-assisted professional development activities. One standard we used to judge the quality of teacher classroom practices is the degree of alignment with the National Assessment of Education Progress (NAEP). The content tested on the NAEP is one appropriate standard against which to judge the quality of content offered in our nation's classrooms because the NAEP is considered to be the nation's report card. The National Education Goals Panel uses the NAEP to monitor progress against our national education goals. The NAEP is, of course, not without its critics. Some would like the NAEP to be more aligned with the National Council of Teachers of Mathematics (NCTM) mathematics standards and National Research Council (NRC) science content standards. Others would like the NAEP to place a heavier emphasis upon what they see as more basic skills.

To allow comparisons to the NAEP, we obtained all mathematics and science items for NAEP assessments in grades 4, 8, and 12. We then conducted content analyses of these items using the same descriptors of content that were used in the questionnaires completed by teachers. A useful byproduct of this work is the description of the content tested on the NAEP mathematics and science assessments. The two-dimensional content maps we prepared, focusing on the topics and student performance goals tapped by the NAEP items, provide an easily-interpreted picture of the content emphasized on the NAEP, as well as the content not tested.

Our findings on current teaching practice are consistent with other research, especially the Third International Mathematics and Sciences Study (TIMSS). We find that teachers in our 30 case study schools cover a broader range of content, in less depth than is reflected in the NAEP. Teachers might be characterized as teaching for exposure rather than mastery. We find a disturbingly slow-moving curriculum. Much of the content taught at one grade is repeated in the next. Like TIMSS, we find teachers not covering key content areas on which student achievement has been shown to be weak. For example, we find little teacher emphasis on geometry and measurement in mathematics. In contrast, we find teachers emphasizing basic topics, such as number sense and calculation, to a greater extent than is found on NAEP. The emphasis on basic topics is especially true in high-poverty schools.

One positive finding is that teaching practices appear to be moving toward a better balance across performance goals for students. In earlier surveys of teachers' practices, a greater emphasis was found to be given to student memorization of facts and mastery of low-level algorithmic skills, while less emphasis was given to students' ability to apply their knowledge and to communicate with others (Porter et al., 1993). Our longitudinal study baseline data show a much more balanced emphasis in instruction across these varying performance goals.

While our survey findings concerning content are supported in part by our observations of teachers, they also occasionally are challenged. When our observations reveal differences between what we saw and what teachers report, the differences tend to be in the direction of teachers' over-reporting solving novel problems and applying mathematics and science to real-world situations. Still, our observations are largely supportive of the descriptions of classroom practices provided by teachers in response to the survey questions. As reported by Cohen (1990), teachers appear to be getting the message from national professional content standards that better balance needs to occur across performance goals, and they are trying to move in that direction. In at least some cases, however, their practice is not yet there.

Our findings about teacher classroom practices are important in two respects. First, the inadequacies identified in current instruction suggest important targets for Eisenhower and other professional development. Second, the weaknesses in instruction we have identified represent areas in which we hope to track improvement over time, using our longitudinal study, and to relate whatever improvement is observed to characteristics of professional development experienced by the teachers.

TEACHERS' EXPERIENCES IN EISENHOWER-ASSISTED ACTIVITIES

We examined teachers' experiences in Eisenhower-assisted activities in three ways. First, we assessed the effectiveness of Eisenhower-assisted activities by asking teachers to report on the extent to which participation enhanced their knowledge and skills. Next, we examined the quality of Eisenhower-assisted activities, be assessing the extent to which supported activities share features of quality identified in the literature on professional development. Finally, we used our data to assess the strength of the relationship between features of the activities in which teachers participated and teachers' self-reported outcomes.

Effectiveness of Eisenhower-Assisted Professional Development Activities

To measure the effectiveness of Eisenhower-assisted professional development activities, we asked teachers to report on the extent to which participation enhanced their knowledge and skills in six domains: (1) in-depth knowledge of mathematics/science; (2) curriculum; (3) instructional methods; (4) approaches to assessment; (5) use of technology; and (6) approaches to diversity.[3]

When asked directly, many teachers in SAHE-grantee activities and somewhat fewer teachers in district activities report that participation in Eisenhower-supported professional development has led to enhanced knowledge and skills and changes in their classroom teaching practice. For enhanced knowledge and skills, we asked teachers questions about six domains, ranging from enhanced knowledge of mathematics and science, to instructional methods, to approaches to diversity. For example, 48 percent of teachers in district activities and 68 percent of teachers in SAHE-grantee activities report enhanced in-depth knowledge of mathematics or science; and 63 percent of teachers in district activities and 79 percent of teachers in SAHE-grantee activities report enhanced knowledge of instructional methods. Percentages are lower for use of technology and approaches to diversity. Similarly, we asked about improvement in classroom practice, and the percentages were parallel. Once again, there is considerable variability among activities in reported change in practice, and teachers in SAHE-grantee activities report somewhat more change in practice than do teachers in district activities. Overall, our data on knowledge and skills and change in teaching practice suggest that teachers believe they are benefiting from their participation in Eisenhower-assisted professional development.

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[3] The term "Eisenhower-assisted activities" reflects the fact that district Eisenhower funds can support some or all of the cost of professional development activities.

A comparison of our data for SAHE-grantee activities with the results obtained for 34 exemplary summer institutes in mathematics and science, supported by the National Science Foundation, the Department of Education, and other agencies, indicates that teachers participating in SAHE-grantee activities report enhancement of knowledge and skills in mathematics and science content roughly comparable to the results for the 34 exemplary activities.[4] SAHE-grantee activities meet benchmarks for reported teacher outcomes set by other exemplary professional development programs. Teachers participating in district Eisenhower activities, however, show weaker results than do teachers in the 34 exemplary activities.

The Quality of Eisenhower-assisted Activities

Our analysis of the quality of Eisenhower-assisted professional development activities, which appears in Chapter 3, is grounded in the recent literature on the characteristics of professional development. Over the past decade, a considerable literature has emerged on professional development, teacher learning, and teacher change (Corcoran, 1995; Darling-Hammond, 1995; Hargreaves & Fullan, 1992; Hiebert, 1999; Lieberman, 1996; Little, 1993; Loucks-Horsley et al., 1998; Richardson, 1994; Sparks & Loucks-Horsley 1989; Stiles, Loucks-Horsley, & Hewson, 1996). The research literature contains a mix of large- and small-scale studies, including intensive case studies of classroom teaching, evaluations of programs designed to improve teaching and learning, and surveys of teachers about their preservice and in-service preparation and in-service professional development experiences. In addition, there is a large literature describing "best practices" in professional development, drawing on expert experiences.

Despite the size of the literature, however, relatively little systematic research has been conducted on the *effects* of professional development on improvements in teaching or on student outcomes, and very little has been conducted comparing the effects of *alternative forms* of professional development. The research that has been conducted, however, along with the experience of expert practitioners, does provide some preliminary guidance about the characteristics of high-quality professional development (See Loucks-Horsley, 1998.) In particular, several recent studies suggest that professional development that focuses on specific mathematics and science content and the ways students learn such content is especially helpful (Cohen and Hill, 1998; Kennedy, 1998). To measure the quality of Eisenhower-assisted activities, we integrated and operationalized the ideas in the literature on "best practices" in professional development.

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[4] See Carey, N., & Frechtling, J. (1997; March). *Best practice in action: Follow-up survey on teacher enhancement programs.* Arlington, VA: National Science Foundation. Carey and Frechtling indicate that 44 percent of participants in outstanding teacher development programs reported that the programs enhanced their knowledge and understanding of science content to "a great extent" (value of 5 on their 5-point scale). If we isolate the percentage of participants in SAHE-grantee activities who reported that the activity enhanced their mathematics or science knowledge "to a great extent" (value of 5 on the 5-point scale), the percentage is 41 percent. The comparable percent for district activities is 24 percent.

As we reported in Chapter 3, we focus on three "structural features," or characteristics of the structure of a professional development activity. These structural features include:

- the form or organization of the activity—that is, whether the activity is organized as a **reform type,** such as a study group, teacher network, mentoring relationship, committee or task force, internship, individual research project, or teacher research center, in contrast to a traditional workshop or conference;
- the **duration** of the activity, including the total number of contact hours that participants are expected to spend in the activity, as well as the span of time over which the activity takes place; and
- the degree to which the activity emphasizes the **collective participation** of groups of teachers from the same school, department, or grade level, as opposed to the participation of individual teachers from many schools.

In addition to these structural features, we focus on three "core features" or characteristics of the substance of the professional development experience itself:

- the degree to which the activity has a **content focus**—that is, the degree to which the activity is focused on improving and deepening teachers' content knowledge in mathematics and science;
- the extent to which the activity offers opportunities for **active learning** -- that is, opportunities for teachers to become actively engaged in the meaningful analysis of teaching and learning, for example, by reviewing student work or obtaining feedback on their teaching; and
- the degree to which the activity promotes **coherence** in teachers' professional development, by incorporating experiences that are consistent with teachers' goals, aligned with state standards and assessments, and encouraging of continuing professional communication among teachers.

We used these structural and core features to judge the extent to which the Eisenhower program supports high-quality professional development. We found that most Eisenhower-assisted activities are traditional in form, such as workshops, courses, or conferences; and relatively few Eisenhower-assisted activities are reform types of activities, such as study groups, networks, or mentoring relationships. About 79 percent of teachers in district activities are in traditional types of activities— primarily workshops and conferences. About 76 percent of teachers in SAHE-grantee activities are also in traditional activities—primarily workshops and college courses. In contrast, approximately 22 percent of teachers in district activities and 26 percent in SAHE-grantee activities are in reform activities, including teacher networks, study groups, mentoring, committees and task forces, internships, and resource centers.

On average, SAHE-grantee activities are of longer duration than district activities. The average amount of time teachers in district activities report spending in Eisenhower-assisted activities is 25 hours, compared to 51 hours for teachers in SAHE-grantee activities. However, while district activities are shorter than SAHE-grantee activities, the average length of district activities, in hours, has approximately doubled since the last evaluation was conducted in 1988-89.[5] In addition, a higher percentage of SAHE-grantee activities than district activities span an extended period of time. For example, 46 percent of teachers in SAHE-grantee activities are in activities lasting at least six months, including 2 percent lasting more than one year, 20 percent lasting 10-12 months, and 24 percent lasting 6-9 months. Twenty percent of teachers in district activities are in activities lasting at least six months.

On the third structural feature, collective participation, districts outperform SAHE grantees. Although relatively few district or SAHE-grantee activities emphasize the collective participation of teachers from the same department, grade level, or school, district activities give more emphasis to collective participation than do SAHE-grantee activities. Twenty percent of teachers in district Eisenhower-assisted activities report participating with other teachers in their department or grade level, compared to 7 percent of teachers in SAHE-grantee activities; and 19 percent of teachers in district activities report participating with all teachers in their school, compared to 11 percent of teachers in SAHE-grantee activities.

On the last three dimensions of quality—content focus, active learning, and coherence—we find that SAHE-grantee professional development is more likely to place an emphasis on these features than district professional development.

Two thirds of teachers participating in SAHE-supported Eisenhower activities participate in activities that place a major emphasis on content, compared to fifty-one percent of teachers in district Eisenhower-assisted activities. Similarly, the percentage of teachers reporting a major emphasis on each of 18 separate indicators of active learning is higher for SAHE grantees than for districts, but relatively few teachers in either district or SAHE-grantee activities report some elements of active learning. For example, only 5 percent of teachers in district activities and 16 percent of teachers in SAHE-grantee activities report that their teaching was observed by the activity leader.

Teachers in both district and SAHE-grantee activities report that the activities have elements that promote coherence with other aspects of their professional experiences. For example, more than three quarters of teachers in both district and SAHE-grantee activities report that their activities are aligned with state and district standards. Somewhat more teachers in SAHE-grantee than district activities, however, report that their Eisenhower activities built on prior professional development (39 percent compared to 31 percent) or were followed up with later activities (70 percent compared to 53 percent).

Our main finding is that there is enormous variability in quality among Eisenhower-assisted activities. This is not surprising, given that the Eisenhower program operates as a funding stream within broad guidelines. A great deal of discretion is left to districts and SAHE grantees to decide on the nature of the professional development that they will provide, though SAHE grantees have to design programs within the constraints of the SAHE's competition. The variability in quality indicates that some districts are providing the same kinds of high-quality professional development activities that SAHE grantees provide. For example, although many district activities are short, 2 percent of teachers in district activities are in activities spanning more than one year, 8 percent are in activities lasting 10-12 months, and 10 percent are in activities lasting 6-9 months. That some districts provide activities of extended duration, with collective participation, a major focus on content knowledge, a major emphasis on active learning, and coherence with teachers' other experiences, represents an "existence proof" that it is possible for districts to provide such activities.

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[5] The 1988-99 evaluation collected data on duration from districts rather than teachers, so a comparison of results from the 1988-89 and the current evaluation should be interpreted as providing an indication of the general magnitude of the change rather than a precise numerical estimate (see Knapp et al., 1991).

We do not know, however, whether all districts possess the organizational capacity and staffing to provide quality professional development. Districts lacking capacity may well be able to purchase high-quality professional development (e.g., from institutions of higher education) if they are aware of and insist upon the dimensions of quality we have identified.

Finally, the average differences in quality we observe between district and SAHE-grantee activities are associated with parallel differences in cost. Thus, we conclude that high-quality professional development is more expensive than lower-quality professional development. SAHE grantees spend over twice as much per teacher participant as do districts. We estimated that SAHE grantees spend about $512 per participation, in comparison to $185 per participation for districts.[6] High-quality professional development is more expensive.

Why the SAHE-grantee activities are of higher quality, on average, than the district activities is not completely clear. One possible explanation is that districts receive a formula allotment while the SAHE grantees must compete for their award. Both the competition and the SAHE guidelines for the competition may push in directions of higher quality.[7] In addition, IHE/NPOs may, on average, possess more state-of-the-art knowledge about the attributes of high-quality professional development than districts do, and they may have greater capacity to deliver professional development with these attributes. Finally, as noted, high-quality professional development is considerably more expensive per participation. Undoubtedly, districts feel a responsibility to provide professional development to all of their teachers. This may push them in the direction of professional development with lower costs per participation.

Features of Professional Development that Promote Improvements in Teaching

We used our national probability sample of teachers who participated in Eisenhower-assisted professional development to estimate the strength of the relationships among features of the professional development and self-reported teacher outcomes—enhanced knowledge and skills and changed teaching practice. Our analyses, reported in Chapter 3 (Exhibit 3.21), estimate standardized path coefficients while controlling for the subject area of the professional development experience (mathematics or science); school poverty, percent minority, and grade level; and teacher gender, certification, and years of experience.

We find that activities with more positive structural features tend to provide professional development experiences with more positive core features, which in turn tend to produce more positive teacher outcomes. In particular, activities of longer duration, both in time span and in contact hours, tend to place more emphasis on content than shorter activities, provide more opportunities for active learning, and provide more coherent professional development. Activities with more collective participation also tend to provide more opportunities for active learning and offer more coherent professional development. The three core features, in turn, all have independent effects on teachers' reports of enhanced knowledge and skills. Teachers who participate in activities that place a major emphasis on mathematics and science content, for example, are substantially more likely to report enhanced knowledge and skills than teachers in activities that do not emphasize content. (For a more complete description, see Chapter 3.)

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[6] A "participation" is a teacher participant in an Eisenhower-assisted activity. Teachers who participate in more than one activity are counted separately for each activity in which they participate. The dollar per participation figure for districts includes federal Eisenhower dollars only, and does not count the 33 percent matching requirement.

[7] We were not able to conduct a systematic analysis of SAHE competitions.

Thus, our results expand the existing literature by providing empirical support for the contention that professional development that emphasizes content knowledge, active learning, and coherence leads to enhanced teacher knowledge and skill and change in teacher practice. In addition, our results highlight the importance of professional development that engages teachers for an extended number of contact hours, and that spans several months, as opposed to being concentrated in a few days or weeks.

Our results also support the literature in indicating that reform types of professional development tend to produce more positive outcomes than traditional types, but the effect is smaller than we had anticipated. In our analyses, we find effects of the distinction between traditional and reform activities, and they are in the predicted direction, but they are generally not direct effects on teacher outcomes. Rather, the effect of reform versus traditional professional development activities operates indirectly through the structural and core features identified above. That is, *reform activities tend to produce better outcomes primarily because they tend to be of longer duration.* Traditional and reform activities of the same duration tend to have the same effects on reported outcomes. Further, we find a large amount of variability within both traditional and reform-type activities. Traditional activities sometimes have positive characteristics, such as opportunities for active learning, and reform activities sometimes have negative characteristics, such as limited duration.

Further, our analyses show that *the difference between districts and SAHE grantees, in terms of enhanced teacher knowledge and skill and greater change in teacher practice, is explained almost entirely by the SAHE grantees' placing a greater emphasis upon duration, subject-matter content, active learning, and coherence.* In short, if districts placed a greater emphasis upon these characteristics, we would hypothesize that teachers would report their knowledge and skill enhanced to the same extent as teachers in SAHE-grantee activities, and that they would be just as likely to report changing their teaching practice.

DISTRICT MANAGEMENT AND OPERATION OF EISENHOWER-ASSISTED ACTIVITIES

We now turn from describing teachers' experiences in Eisenhower-assisted activities to a description of the ways that districts *manage and operate* their Eisenhower programs. Each district receiving Eisenhower funds generally uses the funds to support a collection of professional development activities. The collection of professional development activities that a district supports with Eisenhower funds can be viewed in its entirety as its "portfolio" of Eisenhower-assisted professional development activities. In our analysis, we examine the factors that influence the quality of the portfolios of professional development activities that districts offer and the extent to which districts engage in efforts to target teachers of high-need students.

The measures we use to characterize the quality of a district's portfolio of Eisenhower-assisted activities are: (1) the percent of participations in reform types of activities, (2) the average span of time of activities (i.e., number of days, weeks, or months), (3) the number of opportunities for active learning in in-district workshops and institutes, and (4) the degree of collective participation in in-district workshops and institutes.[8]

In assessing district management and operations, we focus on the role of several provisions emphasized in the legislation: (1) the *coordination (co-funding)* of Eisenhower-assisted activities with other sources of funding for professional development; (2) the *alignment* of Eisenhower-assisted activities with state and district standards and assessments; (3) the *participation of teachers* and school-level staff in planning Eisenhower-assisted activities; and (4) the use of a process of *continuous improvement*, including monitoring progress against measurable objectives and performance indicators.

The Relationship of District Management and Features of Professional Development

In Chapter 5, we report the results of a path analysis of the relationship between these provisions of the legislation and the characteristics of quality professional development that districts provide. The path analysis is based on a national probability sample. Our path analysis of district professional development portfolios (Exhibit 5.11) controlled for district size, poverty level, consortium, and cluster status. We began our analysis of districts by examining co-funding (one aspect of coordination) and alignment. Consistent with the literature on systemic reform (e.g., Fuhrman, 1993; Smith & O'Day, 1991), we find that *co-funding* Eisenhower professional development activities with other professional development initiatives has important direct and indirect effects on the quality of the Eisenhower-assisted professional development offered by districts. For example, districts that engage in more co-funding of Eisenhower activities with other programs tend to support a greater proportion of reform activities than districts that engage in less co-funding, and they tend to provide more opportunities for collective participation. In addition, districts that engage in more co-funding tend to engage in more extensive continuous improvement efforts, and they tend to involve teachers more widely in planning, both of which are related to increased opportunities for active learning. *Alignment* of professional development with state and district standards and assessments also has positive effects. Districts that align professional development with standards and assessments are more likely to offer reform types of activities. In addition, these districts are more likely than others to engage in continuous improvement, which is related to increased opportunities for active learning. These results (along with others reported in Chapter 5) lead us to conclude that the intentions of the program concerning strategies such as co-funding, alignment, continuous improvement, and teacher involvement in planning are appropriate, in the sense that they appear to lead to higher-quality professional development.

Thus, through analyses of our data, we find support for the appropriateness of the key provisions of the Eisenhower legislation. Generally, these provisions tend to encourage districts to offer professional development with effective structural and core characteristics, as identified in the literature and supported by our evaluation.

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[8] The data from our national sample of teachers show that each of these dimensions is related, either indirectly or directly, to improvements in teachers' knowledge and skills and changes in teaching practice; thus, we consider each of these dimensions as an indicator of high-quality professional development, whether it has a direct effect on teacher outcomes, or operates indirectly (e.g., a reform approach affects teacher outcomes indirectly through its effect on duration).

Variation Among Districts in Management and Operations

Given that co-funding, alignment, teacher participation in planning, continuous improvement, and targeting are intended features of the program, and given that our evidence indicates that these strategies generally lead toward higher-quality professional development, we ask to what extent each is being implemented (Chapter 4).

Co-funding and working closely with other federally supported professional development programs (where the programs are available) occur most often with professional development programs that have a mathematics and/or science focus similar to that of the Eisenhower program. Thus, working closely with other programs and co-funding is more likely between the Eisenhower program and National Science Foundation programs than it is with other Department of Education programs. For example, among teachers in districts with an NSF-funded Urban Systemic Initiative (USI) that supports professional development, over 80 percent are in districts where the Eisenhower project co-funds with the USI. Among teachers in districts with Title I, Part A funds, 50 percent are in districts where the Eisenhower project co-funds with Title I.

Most districts report being engaged in efforts to align Eisenhower-assisted professional development with standards and assessments. Alignment is more likely for state standards and assessments than it is for district standards and assessments and more likely for mathematics than science. In addition, alignment is, however, more likely for standards than for assessments. This may reflect the fact that the ESEA requirement of aligned assessments had not yet gone into effect; alternatively, these results may reflect that districts first establish standards, and then seek to revise their assessments to be aligned with the newly developed standards.

The program intends that teachers participate in planning Eisenhower–assisted activities. Our results indicate that 99 percent of teachers are in districts that report involving teachers in planning professional development. Thus, we conclude that this provision of the law is relatively well-implemented. Still, our case-study data reveal that the Eisenhower legislation's 80–20 rule, calling for at least 80 percent of funds to be used "in a manner that is determined by such teachers and staff" and "to the extent practicable, takes place at the individual school site," is not well-understood and is sometimes not even known to exist. We conclude that this provision of the law could be clarified and given more emphasis in the information provided to projects from the Department of Education and from the states.

Our data suggest that the use of performance indicators to guide the continuous improvement process is not yet widespread in districts that receive Eisenhower funds. Fewer than one in five teachers are in districts that collect data on performance indicators established to guide district professional development efforts. One-third of the teachers are in districts that have developed such indicators. The majority of teachers are in districts whose Eisenhower coordinators are not aware that their state has performance indicators. Clearly, the development of state and district performance indicators is a goal of the program that is not generally being implemented, at least not yet. There are other ways in which districts show some commitment to continuous improvement. Needs assessments through teacher surveys and informal conversations are common. Nearly every district reports evaluating their professional development activities. These evaluations, however, are frequently based on teacher satisfaction surveys or participation counts. It is less common to use observations of teachers' subsequent classroom practice to evaluate the effectiveness of Eisenhower professional development.

Districts report a strong emphasis on recruiting teachers from high-poverty, low-achievement schools, and slightly less emphasis on recruiting teachers from Title I schools. Despite these reported efforts at targeting, and even though districts with larger numbers of high-poverty students receive greater funding, teachers from high-poverty schools are only slightly more likely than others to participate in Eisenhower-funded activities. Apparently, current targeting strategies have limited effectiveness. Perhaps these results are explained, in part, by the fact that most participants in Eisenhower-assisted activities are volunteers and teachers from high-poverty schools are no more or less likely than other teachers to volunteer for professional development. It is possible that districts do not have adequate strategies to shape the incentives and constraints that determine which teachers volunteer.

Differences in Management and Operation of Eisenhower-assisted Activities by District Poverty and Size

Throughout our analyses of district data, we tested to see where the management and operation of Eisenhower-assisted professional development differ significantly according to the district poverty level or the size of the district. All of our analyses simultaneously controlled for size and poverty, so any effects are independent of one another. We also tested for the interaction between these two variables. Of the two variables, district size is much more frequently related to the nature of the Eisenhower professional development provided than is poverty. Generally, larger districts are more likely to provide high-quality professional development than are smaller districts. This is true for features of the activities provided—such as active learning, collective participation, and the span of time over which the activities extend—as well as district management strategies, including alignment with standards and assessments, frequency of co-funded projects, and a commitment to continuous improvement. Also, when several small districts form consortia to deliver Eisenhower professional development, the quality is higher in ways that parallel that for large districts. We speculate that larger districts and consortia have a better infrastructure and greater capacity to provide high-quality professional development. Higher-poverty districts also are more likely to co-fund Eisenhower professional development with other professional development, and they are more likely to be committed to continuous improvement. Large districts and high-poverty districts have a greater variety of funding sources in addition to Eisenhower, increasing opportunities for co-funding, and perhaps creating a complexity that demands a commitment to continuous improvement.

SAHE-GRANTEE MANAGEMENT AND OPERATION OF EISENHOWER-ASSITED ACTIVITIES

SAHE grantees are subject to the same provisions for alignment, continuous improvement, and targeting that districts must follow. However, SAHE grantees also are subject to some additional requirements or guidelines. In particular, the 1994 reauthorization emphasizes the importance of coordination between SAHE grantees and districts in planning and providing professional development. Each SAHE grantee is required to enter into an agreement with one or more districts for the provision of professional development. Further, SAHE-grantee projects are shaped by the priorities and guidelines that the SAHE sets in structuring its competition for the Eisenhower awards.[9]

The Relationship of SAHE-grantee Management to Features of Professional Development

In Chapter 6, we report the results of our analyses of the relationship between intended program strategies, such as alignment, coordination, and continuous improvement, and the quality of the professional development that SAHE grantees provide. The path analysis is based on a national probability sample.

As reported in Chapter 6, Exhibit 6.26, coordination with districts (e.g., use of feedback mechanisms, support and extension of district activities, co-funding and district involvement in planning, implementing and monitoring) is positively associated with the quality of the professional development provided. For example, SAHE grantees that coordinate more extensively with districts provide professional development with a larger number of contact hours. Coordination also has a positive effect on the use of strategies for continuous improvement which, in turn, increases the active learning. In addition, coordination has an indirect effect upon targeting, through its effect upon continuous improvement. These results for coordination parallel those found for the district sample.

Variation Among SAHE Grantees in Management and Operations

We have discussed the legislative requirements for alignment, coordination, co-funding, continuous improvement, and targeting, and their role in shaping effective professional development in SAHE-grantee projects; we now discuss the extent to which SAHE-grantee projects are implementing these management strategies (Chapter 6).

Nearly all SAHE-grantee projects are aligned with state standards, and most are aligned with state assessments and district standards, but less than half are aligned with district assessments. SAHE grantees work closely with districts in several ways, such as communicating with district staff and using district needs assessments, but report low levels of other key components of coordination, such as co-funding and working with the Eisenhower coordinator. Also, SAHE-grantee projects tend to be much more affected by state than district indicators. However, SAHE grantees report moderately high levels of engagement in most other continuous improvement efforts, such as conducting needs assessments and evaluations. These findings suggest that, although the average quality of SAHE-grantee activities is relatively high, it could be further improved by strengthening the coordination between SAHE grantees and districts and giving more emphasis to the use of district indicators.

In addition, although most SAHE-grantee project directors report targeting teachers of low achieving, high-poverty students and teachers in Title I schools, these teachers are much less likely than others to participate in SAHE-grantee activities.

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[9] Relative to SEAs, SAHEs have a smaller number of grantees, and thus may be able to monitor their grantees' projects to help ensure the implementation of quality activities. However, we did not examine the SAHE's monitoring role.

Differences in SAHE-grantee Management and Operation by Institution Type and Departmental Affiliation

In our analysis of SAHE grantees, we compared activities housed in education, mathematics/science, and other departments, and research/doctoral and other types of institutions of higher education. Our results indicate that, on average, projects housed in education departments are stronger in important ways than are projects in mathematics/science departments. Education departments sponsor professional development activities that last more than twice the number of contact hours and span a longer time period. They engage in more types of coordination with the districts from which they draw their teachers, and they place more emphasis on continuous improvement than do mathematics/science departments. Education department projects are especially strong when housed in research/doctoral universities, where they are more likely to put a high focus on content and provide numerous opportunities for active learning.

These findings of the superiority of professional development provided through education departments, in contrast with mathematics/science departments, may be due to the fact that education departments have greater expertise in student and teacher learning of subject matter, as well as experience in coordinating with practitioners. Faculty in these departments are the main contributors to the literature on effective professional development in mathematics and science. Projects in mathematics/science departments, on the other hand, have a strong content focus. Others have noted that, in the training of teachers, quality might be enhanced by better collaboration between educators and scientists. Apparently, the same can be said for continuing teacher education in the form of Eisenhower professional development. Each type of department brings unique strengths to designing and delivering professional development that could be complementary in meaningful collaboration.

LESSONS FOR PROFESSIONAL DEVELOPMENT

These findings of the National Evaluation of the Eisenhower Professional Development Program have a number of lessons for professional development generally and for future Eisenhower legislation and program operations specifically.

First, the program should seek ways to encourage the use of all features of professional development that are related to teacher knowledge and skills, and change in practice. The program should continue emphasizing "sustained and intensive" professional development activities. More specifically, this evaluation suggests that professional development should focus on deepening teachers' *content knowledge* and knowledge of how students learn particular content, on providing opportunities for *active learning*, and on encouraging *coherence* in teachers' professional development experiences. Eisenhower professional development should pursue these goals using activities of greater *duration* and *collective participation.* Clearly, there is considerable room to increase the frequency of these attributes of effective professional development in both district and SAHE-grantee activities. While *reform* professional development is more effective than *traditional* professional development, the advantage of reform activities is explained primarily by greater duration.

Second, the program should develop additional approaches to targeting teachers in high-poverty schools. While increasing the participation of teachers in high-poverty schools is an important goal of the legislation, current approaches to targeting these teachers are insufficient to achieve this goal.

Third, federal indicators might be improved by specifying more clearly the dimensions of high-quality professional development, focusing on annual improvements rather than absolute levels, and setting higher standards. The federal indicators are not as directive as they might be in specifying the dimensions of high-quality professional development. Our analyses suggest that the federal indicators should guide local practice toward greater emphasis upon content knowledge, active learning, and coherence, and that districts should pursue these attributes of professional development through offering activities of greater duration and with more emphasis upon collective participation. In addition, several of the federal indicators are stated in terms of absolute levels to be achieved by a specified date (e.g., "at least 50 percent of teachers"). It would be better to have indicators stated in terms of the amount of improvement needed annually, until an acceptably high level of performance is reached. Finally, the federal indicators set some standards that are too low. For example, in targeting teachers from high-poverty schools, the standard is simply to exceed the national average. Furthermore, in the targeting indicator, participation in Eisenhower professional development is stated as a dichotomous variable (participate or not), while clearly teachers participate in Eisenhower-supported professional development in varying amounts and types.

Fourth, the program should pay attention to building district capacity to foster continuous improvement efforts. If using data to make decisions is to be a serious endeavor, then districts may need assistance in determining the types of data that would be useful and in interpreting them. We believe local evaluation can be done in ways much stronger than current practice, which relies heavily upon participation counts and teacher satisfaction surveys. We recommend that local evaluation of professional development focus on instruction, by assessing the degree to which the professional development is characterized by well-implemented attributes of high-quality professional development: a focus on content, active learning, and coherence, delivered with sufficient duration and collective participation. Such evaluations might be based on a variety of sources of data, including well-designed surveys of participating teachers, and the observation of teachers to assess the extent to which they have made appropriate changes in their instruction. Although the assessment of student achievement might be used as part of a balanced evaluation of professional development, we suggest that local evaluation efforts should not focus on assessing the effects of professional development on student achievement. There are simply too many intervening variables between professional development experiences and subsequent gains in student achievement to make such studies feasible at the local level. Further, collecting and analyzing high-quality data on gains in student achievement is expensive and requires technical skills that may not be present at the local level. Clearly, there needs to be more research that looks at the relationships between features of professional development and gains in student achievement, but this is better done as a part of well-designed major research studies.

Fifth, more information is needed on the characteristics and conditions that give some districts the capacity to provide high-quality professional development. We have speculated that districts could provide the same types of professional development as do SAHE grantees. There are existence proofs of districts doing exactly that. What we do not know from our analyses is the percentage of districts that have the capacity to provide such professional development. Our analyses indicate that larger districts have greater capacity and, to some extent, so do high-poverty districts. This larger capacity may be explained, in part, by their larger district staff and, in part, by their greater Eisenhower funds. Consortia that tie together several small districts into one unit for providing Eisenhower professional development also seem, on average, more effective than small districts. The issue of district capacity is one that should be closely monitored in future research.

Sixth, districts could increase the quality of the professional development they provide by focusing their Eisenhower money on a small number of teachers, rather than spreading it across a large number of teachers. Not surprisingly, high-quality professional development costs more per participant than does lower quality professional development. Districts may feel a greater responsibility to reach a large number of teachers than do SAHE grantees, and this is reflected in the cost per participant. The question is, should districts continue to spread the money from the Eisenhower program across as many teachers as possible? Or, should they focus the money on a small number of teachers, so that they can provide higher quality, more influential professional development? Our results suggest the money should be focused. This recommendation also interacts with the finding about targeting. More effective targeting might, at the same time, provide a rationale for more focused expenditures.

Seventh, one reason that SAHE-grantee professional development is, on average, of higher quality than district professional development may be that SAHE grantees have to compete for funds. We do not know as much about these SAHE-sponsored competitions as we would like. We find that the majority of SAHE grantees have been receiving Eisenhower support for several years. Still, in all cases, IHE/NPOs interested in Eisenhower support must develop a proposal and have it judged worthy of funding. In contrast, districts receive money from the state educational agency on a formula basis, with no competition. Perhaps having districts compete for funds would push them toward higher quality professional development.

Eighth, there is considerable evidence that, on average, education departments in institutions of higher education provide higher quality professional development than do mathematics and science departments. The one exception is that mathematics/science departments in non-research/doctoral institutions focus more on content knowledge than do education departments. We do not have empirical data on interdepartmental collaboration, but, in our case studies, we did not see much evidence of these two types of departments collaborating and combining their expertise to provide high-quality professional development. Lack of collaboration between education and mathematics/science departments is a well-recognized problem in preservice teacher education and may be an issue for in-service education, as well.

Ninth, SAHE-grantee projects should be engaging in higher levels of coordination with districts, as called for in the legislation. The evaluation shows that such coordination is related to the provision of high-quality professional development. Therefore, more attention might be paid to supporting and developing opportunities for SAHE grantees to coordinate and work with districts in mutually beneficial ways—ways that allow grantees to exercise their expertise in developing professional development projects while benefiting from district expertise in serving the needs of their teachers and students.

Finally, the evaluation supports the importance of programs that fund professional development activities within specified subject areas. During the past 15 years, the Eisenhower Professional Development Program has provided continuous support for professional development activities for mathematics and science. This evaluation highlights the importance of the content focus of professional development activities and the role that the Eisenhower program has played in building capacity in these two subjects in school districts. Generic professional development that focuses on teaching techniques without a content focus does not appear to be effective. If the Congress is considering expanding the program, it should consider creating analogous programs in other academic subject areas, rather than eliminating the content focus on mathematics and science.

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PES PLANNING AND EVALUATION SERVICE

Technical Appendices

Designing Effective Professional Development: Lessons from the Eisenhower Program

1999

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TECHNICAL APPENDICES

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APPENDIX A

NATIONAL PROFILE

In the *National Profile*, we collected data from a nationally representative sample of districts and SAHE grantees that received Eisenhower funds during the 1997-98 school year. In each sampled district and SAHE grantee, we conducted a telephone interview with the district Eisenhower coordinator or SAHE-granteee project director, and we obtained a complete list of professional development activities supported with Eisenhower funds over the period from July 1 through December 31, 1997. We then drew a random sample of these Eisenhower-supported activities, and we randomly selected two teachers who attended each sampled activity and asked each sampled teacher to complete a mailed survey.

In the sections that follow, we first discuss the sample design and response rates, the sampling weights, and the methods used in hypothesis tests and standard error estimation for the national sample of districts. We then turn to the sample of SAHE grantees.

Sample Design and Response Rates for District Coordinator Interviews and Teacher Activity Survey

Designing the sample. According to annual performance reports completed by the states, more than 90 percent of the elementary and secondary school districts in the country participate in the Eisenhower program. Because states distribute Eisenhower funds to districts, the U.S. Department of Education does not maintain a list of all participating districts. Thus, we based the district sampling frame for the 1997-98 Teacher Activity Survey on the Common Core of Data (CCD), maintained by the National Center for Education Statistics. At the time we selected the sample, the most recent year for which complete CCD data were available was 1992-93. According to the CCD, there were 14,645 districts in the 1992-1993 school year. Exhibit A.1 displays the universe of districts by the number of teachers employed and poverty status, and Exhibit A.2 displays the distribution of public school teachers. The percentage of students in poverty is based on 1990 Census data, aggregated to the district level by the National Center for Education Statistics. The cut points for the three poverty status groups were chosen to divide the national population of teachers into thirds.[1]

The data in the two tables indicate that district size (as measured by the number of teachers) is highly skewed. About half of the districts in the country have fewer than 60 teachers, but these districts as a group account for less than 10 percent of the teachers. On the other hand, just over 5 percent of the districts in the country have 500 or more teachers, but such districts as a group account for more than half of the teachers in the country.

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[1] Data on the percent of children in poverty are missing for 1,873 districts. We imputed missing data by regression, using other sources of district data in the CCD, including data on free and reduced-price lunch participation, dropout rates, and percent of nonwhite enrollment.

EXHIBIT A.1

Number of School Districts, by District Size and Poverty Status*

	Poverty Status							
District Size (Number of Teachers)	**Less Than 10.9% of Children in Poverty**		**Between 10.9% and 21.4% of Children in Poverty**		**More Than 21.4% of Children in poverty**		**Total**	
	N	(%)	N	(%)	N	(%)	N	(%)
1-9	588	12.3%	271	6.0%	478	13.8%	1337	10.5%
10-19	415	8.7%	425	9.4%	417	12.0%	1257	9.8%
20-29	325	6.8%	408	9.1%	331	9.5%	1064	8.3%
30-39	317	6.6%	430	9.5%	265	7.6%	1012	7.9%
40-49	252	5.3%	330	7.3%	198	5.7%	780	6.1%
50-59	231	4.8%	276	6.1%	152	4.4%	659	5.2%
60-74	303	6.3%	339	7.5%	203	5.8%	845	6.6%
75-99	395	8.3%	427	9.5%	268	7.7%	1090	8.5%
100-149	596	12.5%	502	11.1%	310	8.9%	1408	11.0%
150-199	382	8.0%	275	6.1%	198	5.7%	855	6.7%
200-299	410	8.6%	290	6.4%	221	6.4%	921	7.2%
300-499	300	6.3%	240	5.3%	196	5.6%	736	5.8%
500-999	187	3.9%	190	4.2%	122	3.5%	499	3.9%
1000-4999	81	1.7%	96	2.1%	106	3.1%	283	2.2%
5000+	4	0.0%	10	0.2%	12	0.4%	26	0.2%
Total	4,786	100.1%	4,509	100.0%	3,477	100.0%	12,772	100.0%

* Table excludes districts that are missing poverty data. See footnote 1.

EXHIBIT A.2

Number of Teachers Employed by Public School Districts, by District Size and Poverty Status*

	Poverty Status							
District Size (Number of Teachers)	**Less Than 10.9% of Children in Poverty**		**Between 10.9% and 21.4% of Children in Poverty**		**More Than 21.4% of Children in poverty**		**Total**	
	N	(%)	N	(%)	N	(%)	N	(%)
1-9	2,196	0.3%	1,404	0.2%	2,025	0.3%	5,625	0.2%
10-19	5,763	0.8%	6,079	0.8%	5,906	0.8%	17,748	0.8%
20-29	7,727	1.0%	9,586	1.3%	7,777	1.0%	25,090	1.1%
30-39	10,824	1.4%	14,635	1.9%	9,097	1.2%	34,556	1.5%
40-49	11,024	1.5%	14,492	1.9%	8,664	1.1%	34,180	1.5%
50-59	12,469	1.7%	14,871	2.0%	8,233	1.1%	35,573	1.6%
60-74	20,115	2.7%	22,538	3.0%	13,450	1.8%	56,103	2.5%
75-99	34,074	4.5%	36,554	4.8%	22,937	3.0%	93,565	4.1%
100-149	72,692	9.7%	60,811	8.0%	38,103	5.0%	171,606	7.6%
150-199	65,846	8.8%	47,494	6.3%	34,042	4.5%	147,382	6.5%
200-299	99,177	13.2%	70,505	9.3%	54,279	7.2%	223,961	9.9%
300-499	115,453	15.4%	91,695	12.1%	74,274	9.8%	281,422	12.4%
500-999	125,039	16.7%	128,756	17.0%	82,304	10.9%	336,099	14.8%
1000-4999	141,556	18.9%	171,126	22.6%	218,500	28.8%	531,182	23.4%
5000+	25,301	3.4%	67,609	8.9%	178,376	23.5%	271,286	12.0%
Total	749,256	100.0%	758,155	100.0%	757,967	100.0%	2,265,378	100.0%

* Table excludes districts that are missing poverty data. See footnote 1.

Because district size is highly skewed, a simple random sample would contain many small districts representing very few teachers. Thus, we drew the sample of districts with probability proportional to district size, separately within each of the three poverty strata, using the number of teachers employed as the measure of size. This approach allowed us to obtain efficient estimates of Eisenhower program characteristics, weighting districts in proportion to the number of teachers employed. Within each stratum, we selected with certainty all districts with 5,000 or more teachers—four low-poverty districts, 10 medium-poverty districts, and 12 high-poverty districts.

To obtain sufficiently precise estimates of program characteristics, we planned to conduct interviews with 400 district coordinators. Based on pilot interviews in a small sample of districts, we learned that, in some large districts, Eisenhower funds are divided among subdistricts. When districts divide funds among subdistricts, we concluded that it might be necessary to conduct separate interviews and obtain separate activity lists within each subdistrict. In such cases, each subdistrict would operate, in effect, as a separate district. To estimate the number of subdistrict interviews that might be required, we assumed that subdistrict interviews would occur in only very large districts (i.e., the 26 districts with more than 5,000 teachers), and we assumed that one subdistrict interview would be required per 5,000 teachers. These calculations led us to estimate that the 26 certainty districts in our sample might generate 53 interviews altogether—27 more than would be required without subdistricts.

Since we desired an overall sample size of 400 *interviews*, we set a total sample size of 373 *districts*, to accommodate the anticipated 27 additional subdistrict interviews. Because we planned to select 26 districts with certainty, this left 347 districts to be drawn with probability proportional to size. We allocated these 347 districts to the three strata in proportion to each stratum's total number of teachers in districts with fewer than 5,000 teachers. This procedure yielded a sample size of 140 low poverty districts, 129 medium-poverty districts, and 104 high-poverty districts.[2]

Screening districts and scheduling interviews. After drawing an initial sample of districts, we contacted the states in which the sample districts were located to check whether the sampled districts participated in the Eisenhower program and to obtain the name and telephone number of the district Eisenhower coordinator. About seven percent of districts did not participate. We replaced non-participating districts that fell into the sample with randomly drawn districts of similar size and poverty status.

Finally, we contacted the districts drawn into the sample to invite them to participate in the evaluation. If a district refused, we replaced the district with a randomly drawn district of similar size and poverty status.[3] In all, we contacted 409 districts that received Eisenhower funds and were thus eligible to participate in the study.

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[2] The variation in sample size across the three strata is a consequence of differences across the strata in the size of the certainty districts. Although all three strata have about 750,000 teachers, 178,376 of the teachers in the high-poverty stratum are in certainty districts, while only 67,609 of the teachers in the medium-poverty stratum are in certainty districts. Since the non-certainty districts were drawn with probability proportional to size, this implies that more non-certainty districts were required in the medium-poverty stratum than in the high-poverty stratum.

[3] Only one of the 26 certainty districts refused, and it was replaced with the largest available non-certainty district that had not already been drawn into the sample.

When we contacted each sampled district, we asked the district if it participated as an individual district or as a member of a consortium.[4] For districts that were members of consortia, we treated the consortium rather than the district as the unit of analysis. For each consortium included in our sample, we obtained a list of the districts participating in the consortium, along with the number of teachers each district employed. We then used these data to determine the probability with which each consortium was drawn.[5,6] Most of the districts with enrollments below 1,500 that were drawn into the sample were members of consortia.

In addition, during our initial contact with each district, we confirmed the name of the district Eisenhower coordinator and conducted a screening interview to determine whether the Eisenhower program in the district was administered through subdistricts, and, if so, whether separate subdistrict interviews would be required. The screening interviews indicated a number of districts administered the program through subdistricts, but separate subdistrict interviews would be needed only in one large certainty district. Thus, in this large district, we sampled 11 subdistricts—the expected number that would have been drawn into the sample had each subdistrict been a separate district in the original sampling frame. As a consequence, the total number of districts and subdistricts we asked to participate in the study was 419—408 districts and 11 subdistricts.

During the screening interview, we asked whether the Eisenhower program was administered by a single coordinator in the district, or whether funds were allocated to be administered separately by distinct organizational units, for example, the offices of a mathematics currciulum coordinator and science curriculum coordinator. In 15 districts in which funds were allocated to separate organizational units, we learned that we would need to conduct separate interviews with each unit and obtain separate activity lists. Of these 15 districts, 12 involved two administrators, one involved three, and two involved four, producing 35 potential interviews in all.[7] Thus, the 419 districts and subdistricts we contacted generated a total of 439 potential interviews, including the 35 interviews in the 15 districts that administered their programs in separate organizational units.

Response rates for district interviews. We attempted to schedule and complete an hour-long computer-assisted telephone interview (CATI) with each of the 439 administrators identified through the screening process. Of these 439 potential interviews, we completed 386, for an *overall interview response rate* of 88 percent.

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[4] Districts that receive less than $10,000 are required to collaborate with other districts, in consortia, in order to receive program funds, unless this requirement is explicitly waived. Most districts with enrollments below 1,500 that participate in the Eisenhower program do so as members of consortia. Each consortium operates as an administrative unit with a single Eisenhower budget, program, and coordinator.

[5] Since each consortium drawn into the sample would have been included had *any* of its member districts been drawn, the probability of drawing each consortium is equal to the sum of the individual sampling probabilities of the consorium's member districts.

[6] We estimated the percent of school-age children in poverty for each consortium by computing the weighted average of the percent of school-age children in poverty in the member districts, weighting each district by the number of teachers employed.

[7] In about ten other districts in which the administration of the program was split among separate units, the administrators involved decided to participate in the interview as a group.

Of the completed interviews, 32 were in districts in which the program was administered by separate organizational units.[8] In our analyses, we collapsed the multiple interviews conducted in each of these districts into a single district-level response for each item.[9]

Altogether, we completed interviews in 369 districts and consortia, of the 419 districts and subdistricts in which we attempted interviews. This produces a *district-level response* rate of 88 percent. This response rate, based on the number of responding *districts* (369 of 419), is nearly identical to the response rate based on the number of *interviews* completed (386 of 439), which we discussed above. Of the 369 completed interviews, six were unreadable due to a malfunction of the Computer-assisted Telephone interviews (CATI) software, leaving 363 in our basic analytic sample.[10]

Exhibit A.3, reports the realized sample size by district size (number of teachers) and poverty status.[11,12]

We examined the response rates for the district telephone interviews to determine whether response rates differ by district size or poverty. We observe a moderate-size effect: large districts and consortia were somewhat more likely to complete a coordinator interview than small districts ($p<.05$; see Exhibit A.4). We did not observe an effect of district poverty on response rates.

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[8] Interviews with at least one administrative unit were completed in each of the 15 districts in which the program is administered by separate units.

[9] For items asking for a total (for example, the total number of activities supported with Eisenhower funds), we summed across the separate interviews to obtain a district-level response. For items asking for a typical or average response, we averaged the responses across the separate interviews. For items asking whether a particular type of activity or event occurred (for example, study groups or mentoring), we generated a district-level response by examining whether the event in question occurred in any of the separate interviews.

[10] The six lost interviews can be viewed as a random draw from the completed set of 369. If the six lost interviews are considered as reducing the size of the originally drawn sample, our response rate can be computed as 363 respondents from among 413 intended interviews, which produces a response rate of 88 percent. If they are considered as non-respondents, our response rate drops to 87 percent.

[11] For each sampled district that was a member of a consortium, the district size shown in the table is the sum of the number of teachers in all districts participating in the consortium. Two consortia have a size of more than 5000 teachers.

[12] Of the 26 certainty districts in the sample, one did not respond. Also, as discussed above, for one large certainty district, we subsampled 11 community districts (subdistricts). Each responding community district in New York appears as separate "district" in Exhibit A.3. Thus, the total number of districts with size above 5000 shown in the Exhibit is 26 – 24 of the certainty districts in the sample, plus two consortia (see note 11).

EXHIBIT A.3

Number of Districts That Responded to the District Coordinator Telephone Survey, by Size and Poverty Status

	Poverty Status							
District Size (Number of Teachers)	**Less Than 10.9% of Children in Poverty**		**Between 10.9% and 21.4% of Children in Poverty**		**More Than 21.4% of Children in Poverty**		**Total**	
	N	(%)	N	(%)	N	(%)	N	(%)
1-9	0	0.0%	0	0.0%	1	1.0%	1	0.3%
10-19	1	0.7%	2	1.5%	0	0.0%	3	0.8%
20-29	1	0.7%	0	0.0%	0	0.0%	1	0.3%
30-39	1	0.7%	1	0.8%	1	1.0%	3	0.8%
40-49	1	0.7%	0	0.0%	0	0.0%	1	0.3%
50-59	2	1.5%	2	1.5%	1	1.0%	5	1.4%
60-74	1	0.7%	1	0.8%	2	2.1%	4	1.1%
75-99	3	2.2%	6	4.6%	3	3.1%	12	3.3%
100-149	11	8.1%	8	6.2%	10	10.3%	29	8.0%
150-199	12	8.8%	8	6.2%	3	3.1%	23	6.3%
200-299	16	11.8%	11	8.5%	4	4.1%	31	8.5%
300-499	17	12.5%	13	10.0%	12	12.4%	42	11.6%
500-999	23	16.9%	23	17.7%	6	6.2%	52	14.3%
1000-4999	43	31.6%	43	33.1%	44	45.4%	130	35.8%
5000+	4	2.9%	12	9.2%	10	10.3%	26	7.2%
Total	136	100.0%	130	100.0%	97	100.0%	363	100.0%

EXHIBIT A.4

Response Rates for District Interview, by District Size

District size	Number of completed telephone interviews*	Percent of intended sample*
Small (1-249 teachers)	98	82%
Medium (250-499 teachers)	130	87%
Large (500 or more teachers)	98	94%
Consortium	37	95%
Total	363	88%

* Number of completed interviews and base for response rates exclude 6 districts in which interviews could not be included in final data set.

Sampling activities and teachers. Within each district in which we completed an interview, we asked the Eisenhower coordinator to provide a complete list of all Eisenhower-assisted activities conducted in the district over the period from July 1 through December 31, 1997. Ten of the 369 districts with completed interviews did not conduct any Eisenhower-assisted activities during this period, leaving 359 from which we potentially could obtain activity lists.[13]

For most districts, we drew two activities at random from the complete list of mathematics and science activities provided, with probability proportional to the number of participants in each activity.[14] For districts with more than 7,500 teachers, we drew one activity for each 2,500 teachers teaching in the district.[15] Thus, for example, we drew three activities in districts with between 7,500 and 9,999 teachers, and four activities in districts with between 10,000 and 12,249 teachers.

Once the sample of activities was drawn for each district, we asked the district Eisenhower coordinator to provide a list of all teachers participating in each of the sampled activities. We then drew a simple random sample of two teachers for each of the selected activities.[16,17] Of the 359 districts from which we attempted to obtain activity lists and teacher names, we obtained complete activity lists and teacher names from 312, a response rate of 87 percent.[18] We examined variation in response rates for activity lists and teacher names by district size and poverty. We observed some differences in the response rates for activity lists by district size, but there is no clear pattern (see Exhibit A.5). We did not observe any differences in response by poverty.

EXHIBIT A.5

Response Rates for Activity Lists and Teacher Names, by District Size

District size	Number of districts providing activity lists and teacher names*	Percent of intended sample*
Small (1-249 teachers)	77	84%
Medium (250-499 teachers)	121	93%
Large (500 or more teachers)	80	80%
Consortium	34	92%
Total	312	87%

* Intended sample includes 359 districts that completed a telephone interview and conducted activities over the period from July 1 through December 31, 1997.

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[13] The ten districts that received Eisenhower funds for the 1997-98 school year but did not conduct activities over the period from July through December 1997 expected to conduct activities later in the school year.

[14] Because our questionnaire items asked explicitly about the content of the activity, it was necessary to restrict our focus to mathematics and science activities.

[15] We selected more than two activities in the largest certainty districts to maintain roughly equal teacher selection probabilties across districts. See the discussion of sampling weights, below.

[16] To facilitate the process of obtaining teacher names for each sampled activity, we gave district coordinators the option of sending us a complete list of teacher names for the sampled activity, or instead giving us the names of two teachers appearing in specific randomly determined positions on the list of teachers. (For example, if an activity included 15 teachers, and our random selection process determined that the 5th and 12th teachers should be drawn, we asked the coordinator to count down the list and give us the names of the 5th and 12th teachers.)

[17] In drawing the sample of individuals to receive the teacher survey, we excluded participants other than teachers (for example, administrators or paraprofessionals).

[18] This response rate is based on districts that completed interviews and conducted activities over the period from July 1, 1997 through December 31, 1997. For the full intended sample of 409 districts, less 10 that did not offer activities during the relevant period, the response rate for activity lists and teacher names is 78 percent.

Response rates for teachers. Altogether, for the 312 districts for which we obtained activity lists and teacher names, we sampled 1,255 teachers.[19,20] We obtained the school address for each of these 1,255 teachers from the Eisenhower coordinators, and we mailed either a mathematics or science form of the teacher activity survey, depending on the type of activity attended.

Some teachers who received a survey did not remember attending the activities that drew them into the sample. For example, some teachers indicated that they had been scheduled to attend, but were unable to participate. In addition, some addresses we obtained from the district Eisenhower coordinators were in error, because the participating teachers had changed schools or left teaching since attending the sampled activities. Finally, a few of the sampled teachers were seriously ill or out of the country and could not be contacted. Based on a careful effort to locate and contact each sampled teacher by telephone, we concluded that 142 of the 1,255 sampled teachers (or 11 percent) were out of scope, because they had not attended the sampled activities, or they could not be located, because the address provided by the Eisenhower coordinator was in error and we were unable to obtain a current address.[21] Of the remaining 1,113 potential respondents, we received completed surveys from 783, or just over 70 percent.

We checked whether teacher response rates differed by district size and poverty, as well as for teachers who received mathematics and science surveys, and for teachers in high- and low-poverty schools. We did not find significant differences for any of these factors.

Sampling Probabilities and Weights for the District Coordinator Interview

The final weights used in our analyses of the district coordinator interview data reflect two components: a sampling weight, designed to incorporate the fact that districts in our sample were selected with unequal probabilities, and a weight equal to the number of teachers in each district, included so that our reported results represent the role of the Eisenhower program in proportion to the number of teachers in the districts in which the program operates.

As discussed above, 26 districts (those with 5,000 or more teachers) were included in the national profile with certainty; the remaining sample of districts was drawn with probability proportional to size. The final weights differ for the non-certainty and certainty districts, and thus we will consider each in turn.

Non-certainty districts. In a sample drawn with probability proportional to size, the probability of selection for district k (π^d_k) can be expressed:

$$\pi_k^d = \frac{nT_k}{T}$$

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[19] This number of teachers sampled is larger than four times the number of districts providing activity lists and teacher names, because we sampled more than two activities per district in large districts.

[20] Although we intended to draw two activities per district and two teachers per activity for all districts with fewer than 5,000 teachers, in some cases, our final sample of teachers per district was smaller than four. In a few districts, only one activity in mathematics or science was offered over the relevant period, and thus, in these districts, we sampled only two teachers. Also, in a few districts, only one teacher participated in a sampled activity.

[21] If, during the period in which we conducted the telephone interviews, we learned that a sampled teacher was out of scope, we replaced the teacher with another randomly drawn teacher from the same activity. If we did not learn that a teacher was out of scope until we had completed the telephone interviews, we did not replace the teacher.

where n is the number of districts in the national sample, T_k is the number of teachers in district k, and T is the total number of teachers in all districts in the population.[22]

The sampling weight for district k (w_k) is given by the inverse of the sampling probability:

$$w_k = \frac{1}{\pi_k^d} = \frac{T}{nT_k}$$

The final district weight involves the product of the sampling weight w_k and the number of teachers T_k:

$$f_k = w_k T_k = \frac{T}{nT_k} T_k = \frac{T}{n}$$

Thus, for non-certainty districts, the combination of sampling with probability proportional to size and weighting by the number of teachers produces equal weights for all districts.[23]

Certainty districts. For each district drawn with certainty, the sampling weight (i.e., the inverse of the selection probability) is one. Thus, the final weight for each certainty district is simply the number of teachers in the district, T_k.[24]

Sampling Probabilities and Weights for the District Teacher Activity Survey

We generally sampled two Eisenhower-supported activities in each sampled district and two teachers per sampled activity, as described above. The sampling plan was formulated to give all teachers in Eisenhower-supported activities approximately equal probabilities of selection. The selection probability for teacher *i* in activity *j* in district *k* is a function of three terms: the probability of selection of district *k* (discussed above), the probability of selection of activity *j*, given that district *k* has been selected, and the probability of selection of teacher *i* within activity *j*.

We consider non-certainty districts first, and then turn to certainty districts.

Non-certainty districts. The probability of selection for activity *j*, given that district *k* has been selected, is:

$$\pi^a_{jk|k} = \frac{2t_{jk}}{T_k^E}$$

where t_{jk} is the total number of teachers who participated in activity *j* in district *k* and T_k^E is the total number of teachers who participated in all EPDP-supported activities in district *k*.

The probability of selection of teacher *i*, given that activity *j* in district *k* has been selected, is:

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[22] To compute the probabilities, we set n=347 (the number of non-certainty districts) and T=1,994,092, the number of teachers in districts with fewer than 5,000 teachers.

[23] With n=347 and T=1,994,0992, the constant weight = 5575.

[24] The weights for certainty districts vary from a minimum of about 5,000, for the smallest certainty district, to approximately 25,000, for Los Angeles.

$$\pi^{t}_{ijk|jk} = \frac{2}{t_{jk}}$$

where t_{jk} is the total number of teachers who participated in activity *j* in district *k*.

Thus, the selection probability for teacher *i* in activity *j* in district *k* is:

$$\pi_{ijk} = \pi^{t}_{ijk|jk}\pi^{a}_{jk|k}\pi^{d}_{k} = \left(\frac{2}{t_{jk}}\right)\left(\frac{2t_{jk}}{T^{E}_{k}}\right)\left(\frac{nT_{k}}{T}\right) = \left(\frac{4t_{jk}nT_{k}}{t_{jk}T^{E}_{k}T}\right) = \left(\frac{4n}{T}\right)\left(\frac{T_{k}}{T^{E}_{k}}\right)$$

Hence, the sampling weight w_{ijk} for teacher *i* in activity *j* in district *k* can be expressed:

$$w_{ijk} = \left(\frac{T}{4n}\right)\left(\frac{T^{E}_{k}}{T_{k}}\right)$$

As can be seen, the sampling weight is independent of the teacher or the particular activity in which a teacher participates (that is, the terms "*i*" and "*j*" do not appear in the expression for the sampling weight). But the probability of selection does vary across districts, in proportion to the term $\left(\frac{T^{E}_{k}}{T_{k}}\right)$.

The numerator of the term is the number of teacher participations in Eisenhower-assisted activities in district *k*, and the denominator is the total number of teachers in the district. In other words, the term $\left(\frac{T^{E}_{k}}{T_{k}}\right)$ is the teacher participation rate in Eisenhower-activities in the district. The term reflects the fact that *sampled teachers are given more weight if they are in districts with high participation rates than in districts with low rates.*

To calculate the sampling weights for the teachers in our sample, we required data on the number of Eisenhower participations in each district, T_{k}^{E}. For each district in our sample, we used the average of two estimates: the total number of participations reported in the activity list we obtained from the district, and the number of participations reported in the telephone interview.[25] A few districts (about five percent) had seemingly extreme values for one or the other of these participation rates. We viewed a participation rate of 2.5 percent of the teachers in a district as a plausible lower bound on the participation rate, and a participation rate of 200 percent as a plausible upper bound.[26] If one of the two estimated rates for a district was outside these bounds and the other was inside, we chose the value inside. If both values were outside, we Winsorized the estimate, i.e., we chose the lower bound if both values were low, and the upper bound if both values were high.

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[25] We assumed that each of these two sources was somewhat unreliable, and thus the average of the two would be more reliable than either alone.

[26] A participation rate of 200 percent might imply that each teacher in a district participated in two Eisenhower-assisted activities.

Certainty districts. For certainty districts, the number of activities we sampled was a function of district size. The probability of selection for activity *j*, given that district *k* has been selected, can be written:

$$\pi^{a}_{jk|k} = \frac{m_k t_{jk}}{T^{E}_{k}}$$

where m_k is the total number of activities selected in district *k*, t_{jk} is the total number of teachers who participated in activity *j* in district *k*, and T_k^E is the total number of teachers who participated in all Eisenhower-supported activities in district *k*. We chose m_k, the number of activities sampled in district *k*, based on the number of teachers in the district, T_k. In particular, we selected 2 teachers in districts with between 5,000 and 7,500 teachers, 3 in districts with between 7,500 and 10,000 teachers, and so forth. Thus, in approximate terms:

$$m_k = \frac{2 * T_k}{5000}$$

Hence, the probability of selection for activity *j*, given that district *k* has been selected, can be expressed:

$$\pi^{a}_{jk|k} = \left(\frac{2 * T_k}{5000}\right)\left(\frac{t_{jk}}{T^{E}_{k}}\right)$$

Or,

$$\pi^{a}_{jk|k} = \left(\frac{2 * t_{jk}}{5000}\right)\left(\frac{T_k}{T^{E}_{k}}\right)$$

The probability of selection of teacher *i*, given that activity *j* in district *k* has been selected, can be written:

$$\pi^{t}_{ijk|jk} = \frac{2}{t_{jk}}$$

where t_{jk} is the total number of teachers who participated in activity *j* in certainty district *k*.

Thus, the selection probability for teacher *i* in activity *j* in district *k* is:

$$\pi_{ijk} = \pi^{t}_{ijk|jk}\pi^{a}_{jk|k}\pi^{d}_{k} = \left(\frac{2}{t_{jk}}\right)\left(\left(\frac{2 * t_{jk}}{5000}\right)\left(\frac{T_k}{T^{E}_{k}}\right)\right)(1) = \left(\frac{4}{5000}\right)\left(\frac{T_k}{T^{E}_{k}}\right)$$

Thus, the final teacher weight for each certainty district is:

$$w_{ijk} = \left(\frac{5000}{4}\right)\left(\frac{T_k^E}{T_k}\right)$$

Like the final teacher weight for non-certainty districts, the weight for certainty districts depends on the participation rate, which we computed using the procedures described above for non-certainty districts.

Methods for District Hypothesis Tests and Standard Error Estimation

In the sections below, we discuss our approach to estimating standard errors for the district telephone interview and teacher activity results.

District coordinator interviews. In the analyses of the district coordinator interview data reported in Chapters 4 and 5, the significance tests are computed according to the assumptions of conventional simple random sampling. These tests do not take into account the fact that there is modest variability in the weights (i.e., the largest certainty districts have larger weights than the other districts in the sample). Taking the variability in the weights into account would produce standard errors slightly larger than those upon which the reported significance tests are based.[27] We have rerun the analyses incorporating the variability in weights, and the significance test results are nearly identical to those reported in Chapters 3 and 4.

Teacher surveys. Our analysis of the characteristics of Eisenhower-supported activities discussed in Chapter 3 rely on teacher-reported data. The significance tests currently presented in Chapter 3 are computed according to the assumptions of simple random sampling. More precise tests can be conducted that take into account three factors not currently considered in the reported results: the fact that the sample is stratified by poverty, the fact that the final weights vary across teachers in different districts (see the discussion above), and the fact that the reports of teachers who attended the same activities or attended activities in the same districts are not independent.[28] The first of these factors would produce somewhat smaller standard errors than those upon which the reported significance tests are based, while the second and third would produce standard errors somewhat larger. We have rerun the analyses to incorporate these factors, and the significance test results are very similar to those reported in Chapter 3.

Sample Design and Response Rates for IHE/NPO Project Director Interviews and Teacher Activity Survey

Designing the sample. In most respects, the approach we used in sampling institutions of higher education/not-for-profit programs paralleled the process for districts. Thus, in our discussion below, we focus mainly on the differences.

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[27] All analyses reported in Chapters 4 and 5 take into account the fact that the sample is stratified by poverty. All reported analyses of variance explicitly include poverty as a factor, and the regression analyses include the percent of school-age children in poverty as a control.

[28] While the analyses reported in Chapter 3 include school poverty (i.e., percent of students eligible for free lunch) as a control, they do not include district poverty (district percent of school age children in poverty).

The primary difference in our sampling plans for SAHE grantees and districts is in our measure of size. For districts, as discussed above, we sampled with probability proportional to the number of teachers in each district, with the expectation that the number of teachers would be proportional to the number of Eisenhower participants. For SAHE grantees, we could not use the number of teachers as a basis for selection, since SAHE grantees are not staffed with teachers, as are school districts. Furthermore, we could not sample based directly on the number of participants enrolled in Eisenhower-assisted SAHE-grantee activities, because information on the number of participants is not available on the full population of SAHE grantees receiving Eisenhower funds. Hence, we sampled SAHE grantees based on the size of the Eisenhower award each received, in dollars per year. We reasoned that, while the award might not be perfectly correlated with the number of participants, it would serve as a reasonable basis for sampling.

For purposes of the sampling plan, we defined the population of SAHE grantees as all institutions with an Eisenhower grant covering at least part of the 1997-98 school year, and offering at least one Eisenhower-assisted activity during the period from July 1 through December 31, 1997.[29] To construct a sampling frame of the SAHE grantees that received funds for the 1997-98 school year, we contacted the 50 state agency for higher education (SAHE) Eisenhower coordinators and asked them to provide a list of all SAHE grantees that had been awarded grants, along with information on the size of each grant and the grant period, in months. All states provided appropriate information, which is summarized in Exhibit A.6, below.

EXHIBIT A.6

Number of IHE Eisenhower Programs and Number in National Profile Sample, by Size of Grant Received, in Dollars per Year

Size of Grant (dollars per year)	Universe of Institutions	Percent of Institutions	Percent of Funds	Number of Institutions in Sample	Percent of Institutions in Sample
Less than $10,000	44	5.0	0.8	1	1.1
$10,000 -$24,999	220	30.3	12.3	13	14.1
$25,000 - $49,999	257	35.5	28.3	25	27.2
$50,000 - $99,999	164	22.6	35.0	36	39.1
$100,000 or more	48	6.6	23.6	17	18.5
Total	725	100.0	100.0	92	100.0

Screening SAHE grantees and scheduling interviews. We sought a completed sample size of 100 SAHE grantees. Once the initial sample was drawn, we contacted each sampled institution to request participation in the evaluation. As part of the screening process, we determined whether each sampled institution had offered Eisenhower-assisted activities during the period from July 1 through December 31, 1999. Institutions that did not or that declined to participate were replaced with randomly drawn institutions of similar grant size.

Response rates for SAHE grantees. We contacted 120 institutions; of these, 12 did not conduct activities in the relevant period and two did not receive Eisenhower funds over the relevant period, although they were included on the list of funded projects provided by their state. Thus, these

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[29] IHE/NPO grants vary considerably in the period of time covered. Furthermore, the formal grant period may extend over a period substantially longer than the period in which an IHE/NPO offers activities. Hence, we restricted the population to SAHE grantees that offered activities from July through December 1997.

14 institutions did not meet the conditions to be included in our sample, and we considered them out of scope. We replaced each out-of-scope SAHE Grantee with a randomly drawn SAHE granteewith similar annual dollar grant amount.[30] Of the remaining 106 institutions, 92 completed interviews, producing an overall response rate of 87 percent.

Sampling activities and teachers. As we did in each sampled district, we asked each sampled SAHE granteeto provide a complete list of Eisenhower-assisted activities that the institution had offered over the period from July 1 through December 31, 1997, and, from these lists, we selected activities to be included in our sample. We had intended to follow the plan we used for districts, and sample two activities per SAHE grantee. But as we began to receive activity lists from the SAHE grantees, we learned that many SAHE grantees in our sample offered just one activity over the relevant period, and most that offered more than one activity offered a relatively small number. Thus, to maintain the overall desired sample size for activities of about two per district, we decided to sample *all* activities offered by the sampled SAHE grantees. Then, as we did in our district data collection, we obtained the names of two randomly selected teachers who attended each activity. We were able to obtain teacher names for 81 SAHE grantees, or 88 percent of the SAHE grantees in which we conducted interviews.

Response rates for teachers. Altogether, we obtained the names of 334 teachers. Of these, we excluded 27 from the sampling frame because they reported that they did not attend the sampled activity or because we could not obtain a correct address. Of the remaining 307 teachers, we obtained completed responses from 244, or 80 percent.

Sampling Probabilities and Weights for the SAHE-grantee Project Director Interview

The probability of selection for SAHE-grantee k (π^d_k) can be expressed:

$$\pi_k^d = \frac{nG_k}{G}$$

where n is the number of SAHE grantees in the national sample, G_k is the grant size for SAHE-grantee k, and G is the total grant size in all SAHE grantees in the population.[31]

The sampling weight for SAHE-grantee k (w_k) is the inverse of the sampling probability:

$$w_k = \frac{1}{\pi_k^d} = \frac{G}{nG_k}$$

For the district telephone interview, we weighted the results to represent the number of teachers in districts. For SAHE grantees, we cannot carry out an analysis that is exactly parallel, because SAHE grantees are not staffed with teachers. Instead, for the SAHE-grantee analysis, we weighted the results to represent the number of Eisenhower-assisted *teacher participants* in SAHE grantees.

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[30] We did not draw replacements for a few SAHE grantees that we learned were out of scope late in the data collection process, after nearly all other interviews were complete.

[31] One IHE/NPO, with an annual grant size of $749,813, was selected with certainty. To compute the probabilities for the remaining 99 non-certainty IHE/NPOs, we set n=99 and G=$31,778,388.

The final SAHE-grantee weight is the product of the sampling weight w_k and the number of Eisenhower participations in the SAHE-grantee T_k^E:

$$f_k = w_k T_k^E = \frac{G}{nG_k} T_k^E = \left(\frac{G}{n}\right)\left(\frac{T_k^E}{G_k}\right)$$

The first term is a constant. The second term $\left(\frac{T_k^E}{G_k}\right)$ is the number of teacher participations per dollar. The term reflects the fact that *respondents in SAHE grantees that include more participating teachers per grant dollar receive more weight in estimating results*.

Calculating the SAHE-grantee telephone interview weights requires an estimate for the number of teachers per dollar for each participating SAHE grantee. Our SAHE-grantee data provide two estimates of the total number of participants, one from the telephone interview, and the other from the activity lists. A few values for the number of dollars per participant appeared to be too high or too low to be plausible. Thus, we set a plausible lower limit of 0.2 participants per 1000 dollars and an upper limit of 10 participants per 1,000 dollars. If our estimates based on both sources of available data were within these limits, we averaged the two estimates to obtain a final value. If only one was within the limits, we used it. If neither was within the limits, we Winsorized the value, by selecting either the lower or upper limit, as appropriate.

Sampling Probabilities and Weights for the SAHE-grantee Teacher Activity Survey

For each SAHE grantee, we sampled all of the activities supported over the relevant period. The probability of selection for activity j, given that district k has been selected, is thus one.

The probability of selection of teacher i, given that activity j in SAHE-grantee k has been selected, can be written:

$$\pi^t_{ijk|jk} = \frac{2}{t_{jk}}$$

where t_{jk} is the total number of teachers who participated in activity j in SAHE-grantee k.

Since we selected all activities within each sampled SAHE grantee, the probability of selection of activity j given that SAHE-grantee k has been selected is one.

Thus, the overall probability of selection of teacher i in activity j in SAHE-grantee k is:

$$\pi_{ijk} = \pi^t_{ijk|jk}\,\pi^a_{jk|k}\,\pi^d_k = \left(\frac{2}{t_{jk}}\right)(1)\left(\frac{nG_k}{G}\right) = \left(\frac{2n}{G}\right)\left(\frac{G_k}{t_{jk}}\right)$$

Thus, the sampling weight for teacher *i* in activity *j* in SAHE grantee is *k* (i.e., the inverse of the sampling probability) is:

$$w'_{ijk} = \left(\frac{G}{2n}\right)\left(\frac{t_{jk}}{G_k}\right)$$

Computing the weight as derived above would require separate estimates of $\left(\frac{t_{jk}}{G_k}\right)$, the number of participants per grant dollar, for each activity *j* within each SAHE-grantee *k*. The variation among weights for different activities within the same SAHE grantee reflects fact that we sampled all activities within each SAHE grantee, and thus teachers in large activities were less likely to be drawn into the sample than teachers in small activities.

The activity lists provide data on the number of teachers in each activity, t_{jk}, and thus the lists could in principle be used to calculate distinct values for the weights for each activity. But we elected instead to compute a single "average" weight for all teachers in the same SAHE grantee. We computed the weight for SAHE-grantee *k* by summing the weights as derived above for all sampled teachers in all of the activities SAHE-grantee *k* offered and then dividing by the number of teachers in the sample for SAHE-grantee *k*.

The first part of this computation—the sum of the weights across all sampled teachers in all activities *j* in SAHE-grantee *k*, assuming 2 sampled teachers per activity—is:

$$\sum_j 2\left(\frac{G}{2n}\right)\left(\frac{t_{jk}}{G_k}\right) = \left(\frac{G}{n}\right)\left(\frac{T_k^E}{G_k}\right)$$

In other words, the sum of the teacher weights for all sampled teachers in SAHE-grantee *k* is the final weight for SAHE-grantee *k* derived in the telephone interview (see above). Thus, the "average" weight for each sampled teacher in SAHE-grantee *k*, which we used for the teacher activity survey, is the telephone interview weight, divided by the number of teachers in the sample for SAHE-grantee *k*.

This approach to computing the teacher weight for the SAHE grantee sample has two main advantages. First, it makes the resulting teacher weights consistent with the telephone interview weights. In computing the telephone interview weights, as described above, we averaged two sources of data to compute a value for $\left(\frac{T_k^E}{G_k}\right)$—data from the activity lists and data from the telephone interviews. We have only one source of data on the number of teachers in each activity—the activity lists themselves—and thus we cannot carry out an analogous averaging procedure for each activity.

Second, by averaging across activities, this procedure reduces the potential variation in weights that would arise due to any errors in the activity lists—for example, missing teachers from some activities.

Although we believe the averaging process we chose has several advantages, we expect that it has relatively little effect on the final results, in comparison to the results that would be obtained using separate weights for each activity. In particular, 48 of the 92 SAHE grantees in our sample had only one activity, according to the activity list provided, and thus they were not influenced by the averaging procedure; and many of the rest had activities of relatively similar size.

Methods for SAHE-grantee Hypothesis Tests and Standard Error Estimation

In the sections below, we discuss our approach to estimating standard errors for the SAHE-grantee telephone interview and teacher activity results.

SAHE-grantee project director interviews. In the analyses of the SAHE-grantee project interview data reported in Chapter 6, the significance tests are computed according to the assumptions of conventional simple random sampling. These tests do not take into account the fact that there is some variation in the weights across SAHE grantees, due to the variation in the number of teachers served per dollar, as discussed above. Taking the variability in the weights into account would produce standard errors somewhat larger than those upon which the reported significance tests are based. We have rerun the analyses taking the variability of the weights into account, and the results of significance tests are nearly identical to those reported in Chapter 6.

Teacher surveys. Our analysis of the characteristics of Eisenhower-supported activities discussed in Chapter 3 rely on teacher-reported data. The significance tests currently presented in chapter 3 are computed according to the assumptions of simple random sampling. More precise tests can be conducted that take into account two factors not currently considered in the reported results: the fact that the final weights vary across teachers in different SAHE grantees (see the discussion above), and the fact that the reports of teachers who attended the same activities or attended activities in the same SAHE grantees are not independent. Taking these factors into account would produce somewhat larger standard errors than those upon which the reported significance tests are based. We reran the analyses taking these factors into account, and the significance test results are very similar to those reported in Chapter 3.

APPENDIX B

IN-DEPTH AND EXPLORATORY CASE STUDIES

We conducted *In-depth Case Studies* of 10 school districts in five different states, and *Exploratory Case Studies* in six districts in six different states. The goal of the case studies was to provide detailed information on how the Eisenhower program operates in selected states and school districts. Further, the exploratory case studies were designed to identify issues to help inform the design of survey instruments for the National Profile component of the evaluation. (For a report of the results of our exploratory case studies, see Birman, Reeve, & Sattler, 1998.)

Selection of States, and Districts within States, for In-depth Case Studies

We used a two-pronged approach to site selection for the in-depth case studies. First we selected states and then districts. Our goal was to select two districts located in each of five states. We had three main site selection criteria: (1) demographic characteristics of states and districts and geographical region; (2) state-level education reform efforts, including the state's role in professional development; and (3) the district's approach to professional development and its relationships with other state and local reforms.

Demographic Characteristics and Geographic Region

States and districts vary in terms of the size of their populations, the demographic characteristics of their populations, and the region of the country in which they are located. To observe how the Eisenhower Professional Development Program operates in different contexts, we chose states and districts to vary on these factors.

State characteristics. We selected five states to represent different regions of the country. We chose one state from each of the following regions: the Midwest, South, Southwest, Pacific Northwest, and Northeast. Because of the need to achieve variation in terms of district size and demographic characteristics, our sample of states was weighted disproportionately toward states with relatively large populations (i.e., states with greater variety in the characteristics of local districts).

District characteristics. We considered the following demographic factors in selecting districts: 1) total enrollment, 2) racial and ethnic composition of the district's students, 3) poverty level of the district's students, and 4) percent of language minority students. These district-level characteristics are important because we hypothesized that the Eisenhower program operates differently in districts of varying size and because the Title II program is intended to serve the needs of teachers of all students, in particular those placed at risk. For this reason, we selected more than half of the sample (i.e., six districts) with relatively high percentages of students in poverty, and half of the sample with high percentages of student from racial and ethnic minority backgrounds, including two districts with high percentages of students with limited English proficiency.

In addition, because larger districts, by definition, serve larger numbers of students, and because, in general, we hypothesized that larger districts are more likely to be involved in non-traditional professional development, we selected a sample that overrepresented districts with large numbers of students. Districts also were selected to exhibit variation in terms of urbanicity (e.g., urban, suburban, small city, and rural districts).

We compared the national distribution of enrollment, students in poverty, and percent minorities, and chose our sample to reflect these national distributions. For example, Exhibit B.1 shows how enrollment in our sample of case-study districts compares to national figures on enrollment.

EXHIBIT B.1

Number of Selected Districts by Student Enrollment

District Enrollment	Percent of All Children Served in Districts of This Size	Number of Districts Selected for Sample
1-999	5.8 percent	1
1,000-9,999	44.7	3
10,000-24,999	18.6	2
25,000-99,999	19.3	2
100,000+	11.6	2

Exhibit B.2 shows the enrollment figures, the percent of school-aged children in poverty, and the percent of non-white students in each of our case districts.

EXHIBIT B.2

Demographic Information on the 10 In-depth Case-study Districts

	Total Enrollment	Percent School-aged Children in Poverty	Percent Non-white
Boonetown, KY	8,000	18.5	9
Weller, KY	5,000	38.0	<1
Richmond, NY	9,000	25.9	63
East City, NY	1,000,000	30.5	61
Maple City, OH	64,000	30.3	43
Buckeye, OH	11,000	2.2	9
Lone Star, TX	64,000	56.5	80
Rhinestone, TX	200,000	33.6	88
Riverside, WA	19,000	3.9	11
Rainforest, WA	1,500	20.5	17

Selection of Exploratory Case Districts

Like the in-depth cases, we selected the six exploratory case studies, to vary by region, urbanicity, poverty level, and ethnic composition. In addition to being selected for their demographic features, the six exploratory sites also represented districts with features that we believed might influence the program's implementation. The six sites were selected to include: one district that participated in the Eisenhower program through a consortium; at least two sites that had IHE-supported projects working in the district; and two districts located in states that received waivers from ED allowing greater proportions of Eisenhower funds to support professional development in areas outside mathematics and science. Waivers for individual states from particular legislative requirements for the use of Title II money can have important consequences for how states and districts use those funds, as can Ed-Flex status, which allows selected states to grant waivers to individual districts.

Features of State Educational Reform and Approach to Professional Development

We selected states that varied in their statewide education system and reform approaches, as well as their approaches to professional development. Features of the state's educational system and reform efforts form important contextual background for the implementation of the Eisenhower Professional Development Program. For example, the adoption of content and performance standards or a new assessment system can have dramatic implications for how states and districts direct their professional development priorities. Similarly, the presence of other educational initiatives, such as National Science Foundation-funded State Systemic Initiatives (SSI), are often integrally linked with the Eisenhower program in states and districts.

States also vary significantly in the role they play in guiding and providing professional development. Some states play virtually no role, leaving professional development almost entirely up to the discretion of local districts. In many states, the state's most active involvement in professional development is indirect; the state expresses its requirements for individual teachers' professional development through its requirements for certification and recertification. Other states, however, take much more active roles in professional development, often by setting standards for high-quality professional development, mandating that districts, schools, and teachers develop professional development plans, and by directing funds to districts expressly to support professional development.

In the sample of five states for the in-depth case studies, we chose states to have a range of approaches to reform and the extent of state involvement in professional development:

- Kentucky has implemented comprehensive school reform efforts. The Kentucky Education Reform Act of 1990 (KERA) introduced educational goals, an assessment system, increased funding for professional development, a new credentialing system, early childhood programs, technology, "full-service schools," changes in governance structure, and an equalized funding system. Professional development is a key component of KERA, which provides funding for professional development ($23 per average daily attendance) and requires that responsibility for 65 percent of professional development funds be held by school-based councils.

- New York's content and performance standards (with the exception of social studies standards, which are considered weak) are highly regarded. Although New York has traditionally been considered to lag in professional development at the state level, the soon-to-be-implemented requirement that all students take the Regents' examinations has introduced great challenges for the state's teaching force.

- Ohio is in the process of merging content standards with new performance standards for schools and districts, as well as revising its teaching standards and introducing a mentoring program for all beginning teachers. Ohio's content standards in mathematics were rated "exemplary" by the AFT in its review of state standards. In addition, several districts in Ohio are considered to be strong in their professional development programs.

- Texas has a strong system of holding schools and districts accountable for student performance, has raised expectations for student performance, and recently has rewritten its education code to scale back the role of state government in schools. During the 1990s, Texas mandated that all beginning teachers be assigned a mentor and that professional development be primarily school-based and designed to support the achievement of schools' performance objectives. Achievement in the state has risen in recent years; and several districts have been noted for their strong professional development programs.

- Washington focuses on content standards in their Essential Academic Learning reform. The state emphasizes school-based professional development; the state also channels teacher certification fees back to support preservice and in-service training. The state awarded districts $30 million in Student Learning Improvement Grants in 1995-96, and about 75 percent of that money was used to support professional development.

Features of District Approach to Professional Development and Education Reforms

Even in states that are relatively highly involved in professional development, it remains primarily a local responsibility. Districts may take varying approaches to teachers' professional development. In some districts, professional development may remain centered on short-term "traditional" workshops, seminars, and conferences. Other districts may be moving toward professional development with more activities that are sustained over time and that allow teachers opportunities to practice new techniques in their classrooms and receive feedback from colleagues and professional development providers. Still other districts may focus their professional development resources on yet more "reform" types of professional development, such as teacher networks or teacher mentoring programs. We sought districts that were engaging in professional development consistent with at least several dimensions of high-quality professional development, such as extended in-depth learning opportunities, efforts to build a learning community of science and mathematics teachers, linking professional development with other state and district reforms, and use of evaluation and other types of continuous improvement efforts.

The sample of 10 districts was chosen to include examples of these and other types of approaches to professional development. We also chose districts so that our sample included districts with a range of different local reform efforts, such as NSF's Urban Systemic Initiatives or Local Systemic Change projects.

We selected districts that seemed to emphasize reform types of high-quality approaches to professional development. The approach that led us to select a district could be the district's overall plan for professional development, a piece of its approach, or even a single program. Typically we would not expect the approach to be the district's only approach to professional development, but we would want the district to give it enough emphasis to be a significant component of the district's professional development program. We attempted to achieve a range across the sample of 10 districts in the types of approaches they employ (e.g., a district that emphasizes mentoring, a district whose teachers all have individual professional development plans, a district in which professional development is generally developed by teachers). See Chapter 3 for a detailed description of high-quality characteristics of professional development.

Exhibit B.3 provides examples of each case study district's Eisenhower-assisted professional development activities and demonstrates the variety of professional development types of activities in the districts. Exhibit B.4 provides similar information for our exploratory case sites.

EXHIBIT B.3

In-depth Case Studies

DISTRICT PSEUDONYM	DESCRIPTION OF EISENHOWER-ASSISTED ACTIVITIES
Richmond, New York	• *School-based*, 2-day *workshop* focusing on "hands-on math." • Curriculum review committees, workshops, and follow-up study group activities relating to state assessment and core content in math. • *Resource teachers coach* teachers needing assistance with lesson development and delivery.
East City, New York	• In-district workshops and follow-up mentoring activities focus on a variety of math and science topics, such as expanding the pilot math program, Connected Math, with the option to request in-classroom assistance as needed. • Ongoing immersion activities related to projects in conjunction with Botanical Gardens, the Bronx Zoo, and other community organizations. • Tuition reimbursement is available for college courses.
Maple City, Ohio	• Lead teachers attend extended workshops to develop integrated, real-life, thematic units for elementary and middle school mathematics and science instruction. • Selected teachers attend 10, week-long summer workshops dedicated to implementing model math and science programs such as Connecting Math and Science, Building Bridges, and Hands-on Math and Science. • School-based workshops surround the implementation of "Best Practices" strategies.
Buckeye, Ohio	• Lead teachers conduct hands-on inservice that supports an integrated approach to instruction and coach teachers when implementing new practices through networking, team-teaching, and mentoring. • Tuition reimbursement for out-of-district conferences, college courses, day-long, weekend, and summer workshops.
Rhinestone, Texas	• Master teachers provide materials, deliver workshops using manipulatives, and provide mentoring support for the implementation of integrated math activities. • Institute focuses on improvement of algebra lesson preparation aligned with state assessment and curriculum and alignment review committees ensure articulation to state standards across grade levels.
Lone Star, Texas	• During the year of our case visits, Lone Star, Texas school district was undergoing major reorganization and as a result did not offer any Eisenhower-assisted professional development activities.

EXHIBIT B.3 (Continued)

In-depth Case Studies

DISTRICT PSEUDONYM	DESCRIPTION OF EISENHOWER-ASSISTED ACTIVITIES
Riverside, Washington	• Task force develops science kits; committees for each grade level determine principles, activities, materials, and pilot and implement kits. • Summer Science Institute and fellowship opportunity is held in conjunction with local universities and businesses. • Teachers receive professional organization membership for journals and resources. • Short workshops focus on instruction, and support for conferences and other networking opportunities are available as needed.
Rainforest, Washington	• In-district, week-long science institute focuses on hands-on activities, use of manipulatives, lesson demonstration, and instructional strategies. Follow-up includes one-on-one mentoring sessions, teacher observations, and teacher study groups. • Partnerships in Education program allows teachers to network with state and federal agencies research on potential student projects and field trips in science.
Weller, Kentucky	• Goals 2000 master teachers give lesson demonstrations and coach other teachers with unit development. • In-district workshops are dedicated to teacher practice with graphing calculators for state assessment, new math requirements, state core content, and planning for the development of accountability grades for math and science. • Hands-on inservice focuses on higher order thinking skills and "good practices" and supplies applicable materials or kits. • Curriculum task force provides curriculum development and alignment workshops. • Master teachers observe and coach new teachers in the district.
Boonetown, Kentucky	• Resource teachers assigned to two schools model class lessons, observe in classrooms, and coach individual teachers. • In-district workshops focus on improvement of district test scores in math. • Math teachers work on curriculum review and alignment committees. • Tuition reimbursement available for teachers of all grade levels.
West City, California	• Lead teachers are selected to develop a 3-day, district-wide staff development program, weekend seminars, mentoring, and follow-up activities. • Curriculum committees work to approve adoption of new curricula. • Study groups share and compare curriculum and instruction strategies. • Tuition reimbursements, stipends, and substitutes are available for time spent at district conferences, courses, and workshops.

EXHIBIT B.4

Exploratory Case Districts

DISTRICT PSEUDONYM	DESCRIPTION OF EISENHOWER-ASSISTED ACTIVITIES
Middle City, Wisconsin	• Lead teachers attend year-long institute for framework construction in math and science. • Curriculum committee plans adoption of new curricula. • In-district workshops decided by committee, focus on comprehensive standards, curriculum, and assessment, and include follow-up mini-grants for teacher's individual research projects. • Teacher task forces and study groups focus on curriculum-defining activities. • Institutes, mentoring, peer coaching focus on the improvement of math and science teaching strategies and inclusion of multicultural science education. • Internships offer teachers summer work experiences in business and industry, in order to write "real life" curriculum units.
South City, Florida	• In-district institutes and out-of district conferences focus on curriculum content and teaching methods. • Mentors lead activities to help math and science teachers improve instruction including follow-up coaching in math and science. • Mini-grants support inservice presentations and the purchase of classroom materials. • Tuition reimbursement is available for college and university programs.
Commuteville, Virginia	• Colleague teacher program focuses on needs of first-year teachers. • Lead teachers attend 30-week institute for leadership development in math and science to coach other teachers when developing concepts and integrating technology. • District operates a professional development "academy," including five-week math and science workshops and institutes used primarily for recertification. • Tuition reimbursement available for graduate courses and out-of-district conferences, and support for materials.
Northtown, Connecticut	• In-district workshops involving presentations and discussion focus on cooperative learning in math and science, and the creation of hands-on learning kits for elementary students. • Teacher representatives and lead teachers attend out-of-district conferences and institutes focusing on "best practices," such as portfolio assessment, and work in networks and study groups to share information with fellow faculty. • School-based facilitators coach and support elementary school teachers. • Tuition reimbursement available for out-of-district conferences, workshops, and institutes.
Countryplace, Missouri	• District integrates Eisenhower out-of-district conferences, workshops, and inservices on math and science with state-level reform program and professional development committee goals focusing on school improvement. • Informal study groups discuss issues before and after conferences. • Some tuition reimbursement is available for out-of district conferences.

Selection Process

In selecting sites for the 10 in-depth case studies, we drew primarily upon three types of resources. First, we reviewed documents pertinent to states' educational systems and professional development efforts; for example, we drew heavily upon the Consortium for Policy Research in Education (CPRE) report, *Policies and Programs for Professional Development of Teachers: Profiles of the States.* Second, we discussed both states and districts with a team of outside experts in the areas of education reform and professional development. We consulted the following experts:

- Susan Fuhrman of CPRE,
- Jane David of Bay Area Research Group,
- Katie Haycock of the Education Trust,
- Marsha Levine of George Washington University,
- Barbara Scott Nelson of the Education Development Corporation,
- Barbara Neufeld of Education Matters,
- Michael Knapp of the University of Washington,
- Jan Kettelwell of the University of Georgia, and
- Members of our design team:
    - Mary Kennedy, Michigan State University,
    - Susan Loucks-Horsley, WestEd, National Academy of Sciences
    - Jennifer O'Day, University of Wisconsin, Madison,
    - Senta Raizen, The National Center for Improving Science Education, WestEd,
    - Thomas Romberg, Wisconsin Center for Education Research, and
    - Norman Webb, Wisconsin Center for Education Research.

Finally, in collecting information about potential district case sites, we received information from the state Eisenhower coordinators in many states.

Data Collection Procedures

Exploratory Case Studies

In April and May of 1997, we conducted focus groups of teacher-participants in Eisenhower-assisted activities and professional development providers of Eisenhower-assisted activities, in each of the six exploratory case districts. Each focus group included approximately 10 participants, chosen to reflect a range of variation of experiences and perspectives. In the focus groups, we asked questions about: 1) school organization and decision making; 2) curriculum and instruction; 3) characteristics of professional development activities; 4) teachers' and principals' goals for professional development, and how they learn about activities and choose among opportunities; 5) links among different professional development activities and between professional development activities and other reforms; 6) ways the school supports or constrains teachers' ability to take advantage of professional development opportunities; and 7) perceptions of the effectiveness and usefulness of the activities.

In addition, we conducted semi-structured interviews with district-level staff in each of the districts. In each of the six exploratory case districts, we conducted interviews with the superintendent, the Eisenhower coordinators, other professional development coordinators in the district, and the mathematics and science coordinators.

In-depth Case Studies

We conducted our in-depth case studies from January through June of 1998. We spent a total of one week (i.e., approximately five to seven work days) in each of the 10 selected districts. Two trained interviewers from our research team went to each site. We spent about one day conducting interviews at the state level, between a half a day and a day conducting district-level interviews, and between three and four days interviewing and observing teachers and principals at schools in the district. These interviews and observations at three schools in each of our case-study districts were part of the Longitudinal Study of Teacher Change. (For details on the design and methodology of this component of the evaluation, see Appendix C; for the results of this part of the study, see Chapter 2.)

For the in-depth case studies, we conducted approximately six semi-structured interviews with state-level staff in each state, including the Eisenhower SEA and SAHE coordinators, and professional development, curriculum, Title I, and evaluation coordinators. We asked state-level coordinators questions about the following topics: 1) the state's organizational structure as it pertains to the education department; 2) the state's professional development efforts, and how the Eisenhower program fits into those efforts; 3) systemic reform efforts that are occurring in the state; 4) practices and policies for targeting and recruiting teachers for professional development; and 5) the state processes and procedures for continuous improvement such as assessing professional development needs, and planning, evaluating, and monitoring efforts.

In addition to the state-level interviews, we also conducted about four or five interviews in each of the 10 case districts with district-level staff, including the district Eisenhower coordinator, the coordinator of activities sponsored by institutions for higher education, if such activities existed in the district, and the professional development, curriculum, and Title I coordinators. Thus, we conducted about 30 state-level interviews and 43 district-level interviews in all 5 in-depth case study states combined.

In the district-level interviews, we asked questions about how decisions were made about the use of Title II funds, and the nature and extent of the coordination and alignment of the Eisenhower-assisted activities with other professional development and education reform efforts. Interviews also addressed the following topics: 1) the district structure and how Eisenhower funds are administered within that structure; 2) the administration of the Eisenhower-assisted activities program, and how the district's Eisenhower program fits into state and district reform efforts; 3) the relationship between the Eisenhower-assisted activities and local or state systemic reform efforts; 4) targeting and recruiting teachers to participate in Eisenhower-assisted professional development activities; and 5) continuous improvement efforts, such as needs, assessments, planning, guidance, technical assistance, monitoring, and reporting.

In addition, for each case district, interviewers collected and reviewed state and district documents, such as curriculum standards and assessments, as well as extensive documentation on the professional development activities that the district provided, including examples of curricula for activities, and schedules and syllabi for the activities.

APPENDIX C

LONGITUDINAL STUDY OF TEACHER CHANGE

In the *Longitudinal Study of Teacher Change*, we collected data from teachers in 30 schools—three schools in each of our ten In-Depth case districts. We surveyed teachers at three time points: in the fall of 1997, the spring of 1998, and the spring of 1999. Chapter 2 reports results from analyses of the baseline wave of the survey, conducted in the fall of 1997.

In the baseline wave, we asked teachers to describe a mathematics or science course they taught during the 1996-97 school year. In the sections below, we discuss the sample design and response. We then discuss the sample of courses the teachers described in the surveys.

SAMPLE DESIGN AND RESPONSE RATES FOR THE LONGITUDINAL TEACHER SURVEY BASELINE WAVE (FALL 1997)

Designing the Sample

In selecting the overall sample of 30 schools, we balanced several objectives. First, we sought schools in which teachers were likely to participate in Eisenhower-assisted activities over the 1997-98 year, the year in which we conducted site visits, as described in Appendix B. In addition, we desired a mix of elementary, middle, and high schools. Finally, we sought schools that varied in demographic composition, including percent of students in poverty, as measured by eligibility for free lunch, and percent minority. In particular, we planned to oversample high-poverty schools, those with over 50 percent of students eligible for free lunch, because the Eisenhower program intends to encourage the participation of teachers in such schools.

To achieve these objectives, we asked the Eisenhower coordinators in each case district to help us identify schools that met our criteria, and that were willing to participate in our site visits, longitudinal survey, and classroom observations. Based on information provided by the coordinators, as well as demographic information from the Common Core of Data, we selected one elementary, one middle, and one high school in each in-depth case district.[1]

Of the 30 schools in our final sample, 15 are high poverty and 12 have more than 50 percent minority students. In the fall of 1997, student enrollment in the schools ranged from 247 students in one rural elementary school to 1,554 students in a suburban high school, with an average size of 818 students.

In the 30 schools, we planned to survey all teachers who taught mathematics or science during the 1997-98 year. (We did not attempt to locate teachers who taught mathematics or science in the sample schools in 1996-97 but were no longer teaching in the same school in 1997-98.) To identify teachers meeting our criteria, we asked the principals in each of the 30 schools to provide a roster of all teachers, indicating whether each teacher taught mathematics, science, or both.

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[1] One district, East City, includes only elementary and middle schools, so we chose two elementary and one middle. In a second district, Weller, two K-8 schools were selected rather than an elementary and a middle school.

In most cases, the elementary schools in our sample organized instruction in self-contained classrooms, and thus most teachers were general elementary teachers who taught all subjects including both science and mathematics. In schools with self-contained classrooms, we included all elementary teachers in our sample. We randomly selected half of the elementary teachers to receive a mathematics version of the survey and half to receive a science version. Some elementary schools had specialist teachers who taught only mathematics or science and we also included these teachers in our sample.

Almost all of the middle and high schools in our sample were departmentalized, with teachers who were subject-matter specialists. We included all teachers identified as mathematics or science teachers in departmentalized schools, along with any other teachers the schools identified as teaching some mathematics or science, such as the special education teacher.

Response Rates for Teachers

Across the 30 schools, a total of 575 teachers were asked to complete the baseline wave of the survey. Of the 575 teachers surveyed, 430 returned a completed survey, for a response rate of 75 percent (see Exhibit C.1). There are differences in response rates by school; in many schools, response rates are nearly 100 percent, and in others they are below 70 percent. Of the responding teachers, 42 reported that they did not teach mathematics or science in the 1996-97 school year. Generally, these 42 teachers were new teachers in 1997, or had not taught mathematics or science before 1997. Teachers who did not teach mathematics or science were instructed to skip the subject-specific sections of their surveys. Thus, the sample of teachers describing their mathematics or science instruction for 1996-97 consists of 388 teachers.

Of these 388 teachers, 355 (91 percent) completed a sufficiently high proportion of the classroom content items on the survey to include their responses in the analyses of content discussed in Chapter 2, and 383 (99 percent) completed the necessary items on pedagogy[2] (see Exhibit C.1). In order to examine the relationship between content and pedagogy, we limited the sample for the analyses of pedagogy reported in Chapter 2 to the 350 teachers who completed both the content and pedagogy sections.

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[2] Almost half of the teachers who did not fully complete the content items were elementary teachers who received the science version of the survey. It is possible that these teachers did not believe they taught science with sufficient frequency or with sufficient depth to complete the content section.

EXHIBIT C.1

Response Rates
Baseline Longitudinal Teacher Survey, Fall 1997

	Mathematics			Science			
	Elementary School	Middle School	High School	Elementary School	Middle School	High School	TOTAL
A. Number of teachers sent surveys	137	65	89	133	64	87	575
B. Number of surveys returned	91	43	73	101	48	74	430
C. Survey response rate (row B divided by row A)	66%	66%	82%	76%	75%	85%	75%
D. Number of responding teachers who did not teach mathematics or science during 1996-97 year	12	3	0	16	5	6	42
E. Number of responding teachers who taught mathematics or science during 1996-97 year (row B minus row D)	79	40	73	85	43	68	388
F. Number of teachers who completed survey but provided inadequate data for analysis of content taught	5	2	4	16	2	4	33
G. Percent of teachers completing content items (row E minus row F divided by row E)	94%	95%	95%	81%	95%	94%	91%
H. Number of teachers who completed survey but provided inadequate data for analysis of pedagogy	2	0	1	1	0	1	5
I. Percent of teachers completing pedagogy items (row E minus row H divided by row E)	97%	100%	99%	99%	100%	99%	99%
J. Percent of teachers completing both content and pedagogy items	91%	95%	93%	80%	95%	93%	90%

Sample of Teachers

The teachers in the final analysis sample are fairly representative of the general teaching population (see Exhibit C.2). Nationally, 73 percent of teachers are female (Snyder et al., 1999); in this sample, 74 percent are female. Fourteen percent of all teachers are minorities (Snyder et al., 1999) and 18 percent of this sample are minorities. Almost 10 percent of all teachers have less than three years of teaching experience (Snyder et al., 1999); in the Eisenhower Longitudinal Study sample, 9 percent of teachers have less than three years of teaching experience in total, and 11 percent of teachers have less than three years of teaching experience in the surveyed subject.

EXHIBIT C.2

Sample of Teachers: Demographics Baseline Longitudinal Teacher Survey, Fall 1997

Percent (Number[3])

	Mathematics			Science			
	Elementary School	Middle School	High School	Elementary School	Middle School	High School	TOTAL
Gender							
Female	95 (70)	77 (27)	57 (39)	96 (65)	65 (26)	51 (32)	74 (259)
Male	5 (4)	23 (8)	43 (29)	4 (3)	35 (14)	49 (31)	26 (89)
Total	100 (74)	100 (35)	100 (68)	100 (68)	100 (40)	100 (63)	100 (348)
Ethnicity/Race							
Asian or Pacific Islander	-	-	2 (1)	-	-	2 (1)	1 (2)
African American	8 (6)	9 (3)	3 (2)	3 (2)	13 (5)	10 (6)	7 (24)
White	75 (54)	77 (27)	93 (63)	78 (53)	83 (33)	83 (52)	82 (282)
Hispanic	17 (12)	14 (5)	2 (1)	16 (11)	5 (2)	5 (3)	10 (34)
Other	-	-	2 (1)	3 (2)	-	2 (1)	1 (4)
Total	100 (72)	100 (35)	100 (68)	100 (68)	100 (40)	100 (63)	100 (346)
Novice Teachers*							
Across subjects	13 (9)	7 (2)	3 (2)	11 (7)	6 (2)	12 (7)	9 (29)
In surveyed subject	11 (6)	10 (3)	5 (3)	16 (8)	12 (4)	14 (8)	11 (32)

* Three or fewer years of teaching.

Sample of Courses Described in the Longitudinal Teacher Survey, Baseline Wave (Fall 1997)

In the longitudinal teacher survey, we asked teachers to select a mathematics or science course to describe, choosing, if possible, a year-long course they had taught in 1996-97, were continuing to teach in 1997-98, and expected to teach in 1998-99. If there were several courses they could choose, teachers were asked to select a course that enrolled students performing at mixed achievement levels.

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[3] Because some teachers did not complete demographic information on the surveys, the numbers of teachers reported here are slightly lower than the numbers reported in the analyses.

In general, teachers described year-long, mixed achievement courses (see Exhibit C.3). Although most teachers described year-long courses, some teachers, especially science and high school teachers, focused on semester courses. Most teachers chose courses enrolling students of mixed achievement levels, but some teachers, especially mathematics teachers and high school teachers, described classes enrolling students of homogeneous low or high achievement.

EXHIBIT C.3

Sample of Courses Described in the Baseline Longitudinal Teacher Survey, Fall 1997 (n=355*)

	Mathematics			Science			
	Elementary School	**Middle School**	**High School**	**Elementary School**	**Middle School**	**High School**	**TOTAL**
Duration							
Year	92%	97%	74%	73%	87%	73%	81%
Semester	6%	0%	26%	15%	3%	24%	14%
Other	2%	3%	0%	12%	10%	3%	5%
Total	100%	100%	100%	100%	100%	100%	100%
Composition							
Homogeneous high	1%	11%	16%	0%	2%	14%	7%
Homogeneous middle	9%	18%	32%	3%	15%	23%	17%
Homogeneous low	9%	16%	17%	6%	%	8%	10%
Mixed	80%	53%	35%	91%	78%	55%	66%
Total	100%	100%	100%	100%	100%	100%	100%

* In some cases, the n is slightly lower due to missing data.

We asked teachers to report the title of the course they described, as well as the typical grade levels of students enrolled. Not surprisingly, elementary school teachers generally described mathematics and science instruction in self-contained classrooms enrolling students at one or two grade levels (e.g., "4th-grade mathematics"). Most middle school teachers described courses titled "7th-grade or 8th-grade mathematics," but 10 of the middle school mathematics teachers and eight of the middle school science teachers described courses with more specific titles indicating the focus of the course (i.e., pre-algebra and algebra for mathematics, life, earth, and physical science).

Most of the high school teachers described courses with specific titles. Of the high school mathematics teachers surveyed, 32 described algebra courses, 13 described geometry courses, and a few each described calculus, integrated math, or trigonometry. Of the high school science teachers, 18 described biology courses (with a few honors biology), 13 described chemistry courses, 11 described physics courses, and one to three teachers described earth science, physical science, or astronomy. Four of the science courses and five of the mathematics courses were honors, advanced, or advanced placement courses.

APPENDIX D

SUPPLEMENT FOR CHAPTER 2

In this appendix, we describe the methods used to analyze the longitudinal teacher survey data presented in Chapter 2, present some additional details on some of the results presented in the chapter, and discuss some additional analyses related to those presented in the chapter. We begin with a discussion of our analyses of the content taught, and then turn to pedagogy.

CONTENT COVERAGE AND HIGH STANDARDS

As reported in Chapter 2, we drew on the baseline wave of the longitudinal survey to describe the content teachers emphasized in their mathematics and science teaching. We then compared the content emphasized by the teachers in our sample to the content emphasized in the National Assessment of Educational Progress. In the following sections, we describe the methods we used to carry out these analyses and we present some results to supplement those discussed in the chapter.

Measuring the Content Taught

Our main data on content come from the baseline wave of the longitudinal survey of teacher change. We characterize the content taught in terms of two major dimensions: the *topics* covered and the *performance goals* teachers hold for students.

In the content section of the survey, we asked teachers to describe the content they taught in the class they chose to describe, using a two-dimensional matrix. Different forms of the matrix were used for elementary, middle, and high school mathematics and science.

The rows of the matrix contain a comprehensive list of the topics and subtopics teachers might cover. The columns of the matrix contain performance goals for students. Performance goals are teachers' expectations for what students should be able to do. There are six performance goals in the matrix: 1) memorize; 2) understand concepts; 3) perform procedures; 4) generate hypotheses; 5) collect, analyze, and interpret data; and 6) make connections. A *content area* can be defined as the intersection of the two dimensions, topics and performance goals.

Each teacher was asked to follow several steps in describing the teacher's course using the matrix. First, the teacher indicated the amount of time given to each subtopic, using a scale from 0 (no time) through 3 (more than two lessons or class periods). Then, the teacher indicated the relative amount of emphasis given to each performance goal, when teaching the subtopic, using a scale from 0 (no emphasis) to 3 (sustained emphasis). We used the full matrix of data provided by each teacher to calculate the percent of the teacher's total class time devoted to each topic and subtopic, each performance goal, and each content area (intersection of a subtopic and performance goal).

To calculate the percent of a teacher's class time developed to each content area, we carried out the following steps:

Step 1. We calculated the number of class periods that the teacher spent on each subtopic. Teachers indicated whether they gave each subtopic a coverage of 0 (no time), 1 (less than one class/lesson), 2 (one to two classes/lessons), or 3 (more than two classes/lessons). To determine the overall percent of total instructional time over the school year given to each subtopic, we recoded the teachers' responses to reflect the number of class periods/lessons spent on each subtopic. We recoded a coverage of 1 as one-half class period/lesson and a coverage of 2 as one and one-half class periods/lessons. Recoding the coverage for each subtopic in which the teacher reported a coverage of 3 (more than two classes/lessons) was more difficult because we do not know for sure *how many more than two classes/lessons* might have been devoted to the subtopic. To recode the 3's, we assumed that each teacher's total coverage across all subtopics should sum to 180 classes, the typical number of classes in a school year in the study schools. We summed the number of class periods accounted for by all subtopics given a coverage of 1 or 2, and subtracted this from 180 to determined the number of class periods remaining. We then divided this by the number of subtopics given a coverage of 3, to estimate the number of class periods devoted to each class period given a coverage of 3.

Step 2. We computed the proportion of the year spent on each subtopic. We carried out this step by dividing the number of class periods spent on each subtopic by 180, the total number of class periods in the year. We then summed across the subtopics under each topic to estimate the proportion of time spent on each topic. The results of these analyses are presented in Exhibit 2.3 for middle school mathematics, and in Exhibits 2.4 and 2.5 for the subtopics related to measurement for grades K-12.

Step 3. We computed the distribution of instructional time across performance goals for each subtopic. For each subtopic the teacher covered, the teacher was asked to report the relative emphasis given to each of the six performance goals, using a scale from 0 (no emphasis) to 3 (sustained emphasis). For each teacher and each subtopic, we determined the relative emphasis given to each performance goal by dividing the emphasis given to that performance goal by the sum of the emphases given to all six performance goals. For example, if a teacher indicated that she taught addition, and she reported an emphasis of 2 for memorizing, an emphasis of 3 for understanding concepts, an emphasis of 1 for making connections, and an emphasis of 0 for the other performance goals, the *total* emphasis for the performance goals for addition would be 2+3+1=6. The *relative emphasis* on memorizing would be 2/6, or 0.33. This relative emphases on performance goals, aggregated across teachers and subtopics, is presented in Exhibit 2.6 for elementary school mathematics.

Step 4. We calculated the relative emphasis given to each content area (subtopic by performance goal). We carried this out for each content area (subtopic by performance goal) by multiplying the proportion of total instructional time spent on the subtopic by the relative emphasis given to the performance goal within the subtopic. The total number of content areas given at least some coverage is summarized in Exhibit 2.8 for elementary, middle, and high school mathematics and science, and the relative emphasis given to specific content areas is presented in Exhibit 2.9b for elementary school science.

Measuring the Content Emphasized in the NAEP

To determine the consistency of the content taught with high standards, we compared the percent of time each teacher devoted to specific topics, performance goals, and content areas to the relative emphasis given to the same topics, performance goals, and content areas by the National Assessment of Educational Progress (NAEP). Mathematics and science generally are tested in every other NAEP administration, or every four years. The data used for these analyses were the 1996 mathematics and science NAEP tests.

To determine the relative amount of emphasis given by the NAEP to each subtopic, performance goal, and content area in our elementary, middle, and high school science and mathematics matrices, we reviewed the full set of NAEP mathematics and science items for the 1996 tests for fourth, eighth, and twelfth grade (see Exhibit D.1).

EXHIBIT D.1

Number of NAEP Items Rated

	Mathematics	Science
Fourth Grade	185	140
Eighth Grade	241	192
Twelfth Grade	248	206

Two science curriculum experts reviewed the full set of NAEP science items to determine the subtopics and performance goals each item tapped, using the matrix of subtopics and performance goals in the longitudinal surveys. Each expert was asked to identify *from one to three* content areas (i.e., subtopic by performance goal cells) that each item tapped. For example, an expert might indicate that a particular 4th-grade NAEP item tapped memorization of a moon fact—a single content area. Or, the expert might indicate that the item tapped three performance goals pertaining to the moon—memorization, understanding, and performing procedures. Or, the expert might indicate that the item tapped three different subtopics, each with an emphasis on performing procedures. Two mathematics curriculum experts conducted similar analyses for the NAEP mathematics items.

The experts rated the items on the 4th-grade NAEP using the matrix of subtopics and performance goals in the elementary school survey; they rated the items on the 8th-grade NAEP using the matrix in the middle school survey; and they rated the items on the 12th-grade NAEP using the matrix in the high school survey.

We examined the inter-rater reliability of the ratings provided by the two mathematics experts, as well as the reliability of the ratings by the two science experts. Exhibit D.2 displays the percent of the ratings for which the two mathematics or science experts agreed exactly in their judgment of the performance goals or subtopics each item tapped. The results indicate that the raters were reasonably similar in their rating of the performance goals emphasized by the NAEP items, with the percent of agreement among ratings ranging from nearly 45 percent to nearly 65 percent, depending on subject (mathematics or science) and grade level (4th-grade, 8th-grade, or 12th-grade). The degree of agreement among ratings for subtopics is somewhat lower, but still substantial, given the large number of subtopics involved. For example, the content matrix for the 12th-grade science survey contains 191 subtopics, some of which are quite closely related (e.g., cell structure/function and cell metabolism), and thus we would not anticipate perfect agreement among ratings.

EXHIBIT D.2

Inter-rater Reliability for Ratings of NAEP Items (Percent Agreement between Ratings)

	Mathematics			Science		
	Fourth Grade	Eighth Grade	Twelfth Grade	Fourth Grade	Eighth Grade	Twelfth Grade
Subtopics	51.70	50.18	45.85	39.37	44.17	44.12
Performance Goals	44.49	51.97	62.82	64.57	54.17	64.71

To determine the relative amount of emphasis given by the full set of NAEP items to each content area (i.e., each performance goal for each subtopic), we took the following steps.

Step 1. We assigned weights to the ratings given to each item by each rater. To make use of the ratings provided by the experts, we needed to convert the ratings they provided into an estimate of the proportion of emphasis given by NAEP items to each content cell. The process of converting the ratings to a proportion of emphasis is complicated by several factors. First, NAEP items vary in the expected time required to complete them. In estimating the relative emphasis given by the NAEP to each content cell, we weighted items in proportion to NAEP's estimate of the completion time. Second, although in most cases two experts rated each item, in a few cases one of our experts skipped an item. Third, items vary in the number of ratings each of our experts assigned. For some items, raters assigned only a single content cell, while for others, raters assigned as many as three cells.

To take these factors into account, we assigned a weight to each rating by each rater for each item rated. The weight is composed of three factors: 1) the *relative time students were expected to spend on the item* according to NAEP, with a weight of one indicating an item with one correct answer, such as a multiple-choice item and a weight of 2 to 5 indicating a constructed-response item with partial credit possible[1]; 2) the *number of raters* evaluating the item; and 3) the *number of ratings* each rater gave the item. The system of weights ensures that more challenging items are given more weight, that items get equal weight whether they were rated by one rater or two, and that each rater has equal weight, regardless of whether the rater gave the item one, two, or three ratings.

Exhibit D.3 illustrates the weights assigned for the ratings given to a single item by our two raters. In the example, the item is multiple choice in form with only one correct response; it was rated by both raters. Rater 1 assigned the item to two content cells and rater 2 assigned the item to three cells. The item is multiple choice, so the weight reflecting the expected completion time=1.

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[1] We used the number of Item Response Theory (IRT) parameters as the weight for the items. More complex items require more IRT parameters, so they are weighed more heavily. Dichotomous items (i.e., items that are graded as either right or wrong, including all multiple-choice and some short-answer items) have one IRT parameter, and so are weighted by one. Short constructed-response items are questions that "required students to provide answers to computation problems or to describe solutions in one or two sentences"; these items are expected to take two to three minutes to complete (Reese et al., 1997, p. 79). Extended constructed-response items "required students to provide longer answers (e.g., a description of possibilities, a more involved computational analysis, or a description of a patterns and its implications)"; these items are expected to take five minutes to complete (Reese et al., 1997, p. 79).

Both raters rated the item, so the number of raters=2, and the weight for each rater is 1/2, or 0.5. The first rater assigned two ratings to the item; thus, for the first rater, the weight for each rating=1/2, or 0.5. The second rater assigned three ratings to the item; so, for the second rater, the weight for each rating is 1/3 or 0.33.

The three weights pertaining to each rating of each item by each rater are multiplied to obtain a total weight for the rating. Thus, in the example in Exhibit D.3, the weight assigned to the first rating given by the first rater = 0.5*0.5=0.25.

EXHIBIT D.3

Example of Weights for Ratings of One Item

	NAEP Item weight	Rater Weight	Number of Ratings Weight	Total Weight
Rater 1				
Rating 1	1	.50	.50	.25
Rating 2	1	.50	.50	.25
Rater 2				
Rating 1	1	.50	.33	.165
Rating 2	1	.50	.33	.165
Rating 3	1	.50	.33	.165

Step 2. We determined the relative emphasis given by the NAEP to each subtopic. To carry out this step, we summed the total number of weighted rating points given to each subtopic and divided by the total number of rating points given to all subtopics. The relative emphasis given by the NAEP to topics is presented in Exhibit 2.3 for middle school mathematics.

Step 3. We determined the relative emphasis given by the NAEP to each performance goal. To carry out this step, we summed the total number of weighted rating points given to each performance goal and divided by the total number of rating points given to all performance goals. The relative emphasis given by the NAEP to each performance goal is presented in Exhibit 2.6 for elementary school mathematics.

Step 4. We determined the relative emphasis given by the NAEP to each content cell (subtopic by performance goal). To carry out this step, we summed the total number of rating points given to each content cell, and divided by the total rating points given to all cells. This relative emphasis given by the NAEP to content areas is summarized in Exhibit 2.8 and presented in more detail for elementary science in Exhibit 2.9a.

Step 5. We determined the alignment of teachers' reports and the NAEP. As a final step in our analysis, we computed an index of alignment for each teacher, measuring the degree to which the teacher's relative emphasis on each content cell matches the NAEP. We based the index of alignment on Gamoran, Porter, Smithson, and White (1997). For each teacher, the index is computed as the sum, across content areas, of the absolute value of the difference between the emphasis given by the teacher to the content area and the emphasis given by the NAEP. The absolute value is required because the index is designed to capture cells for which the teachers give *more* emphasis than NAEP, as well as those for which they give *less* emphasis. The index is scaled to range from 0.0 to 1.0. The results of the alignment index are presented in Exhibit 2.10.

Supplementary Tables

Topic emphases and high standards. In Exhibit 2.3, we described teachers' emphases on topics, using middle school mathematics teachers as an example. Here, we present the topics emphasized by teachers in the remaining five subgroups: elementary and high school mathematics; and elementary, middle, and high school science.

EXHIBIT D.4a

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Emphasis on Topics – Elementary School Math (n=74)

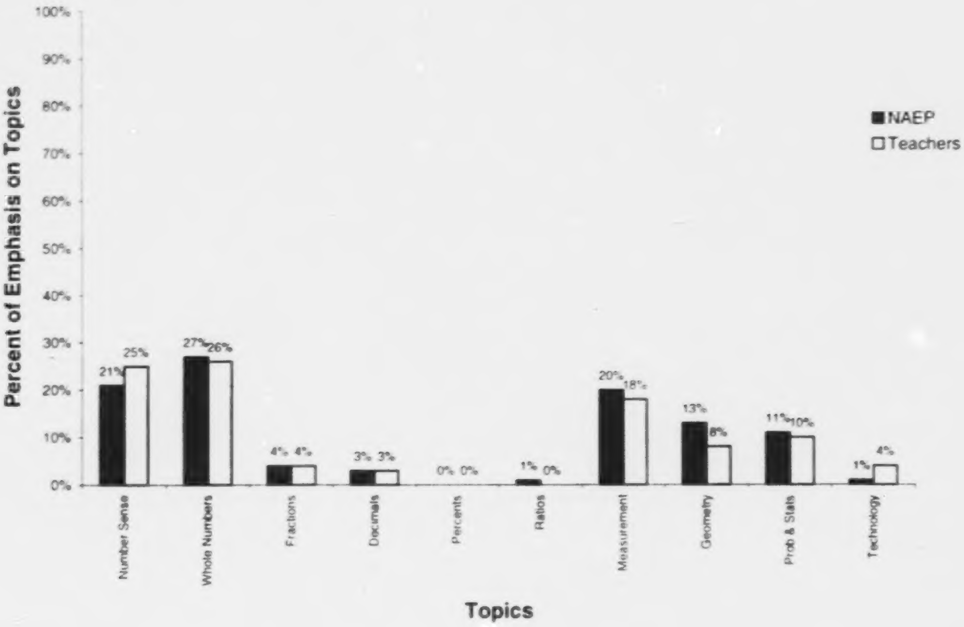

EXHIBIT D.4b

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Emphasis on Topics – High School Math (n=69)

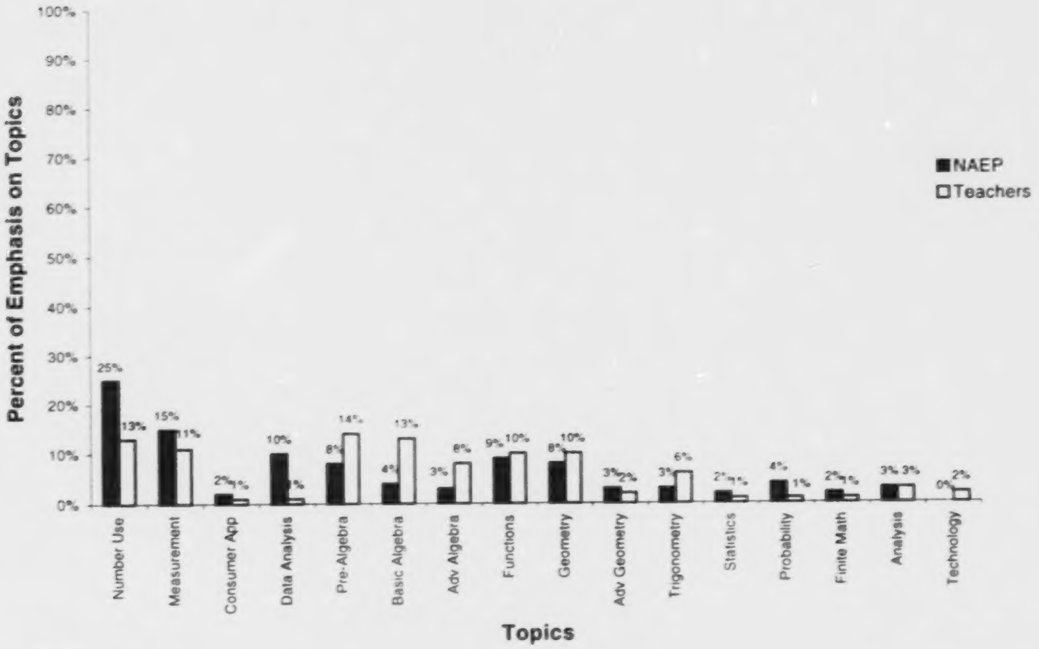

EXHIBIT D.4c

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Emphasis on Topics - Elementary School Science (n=69)

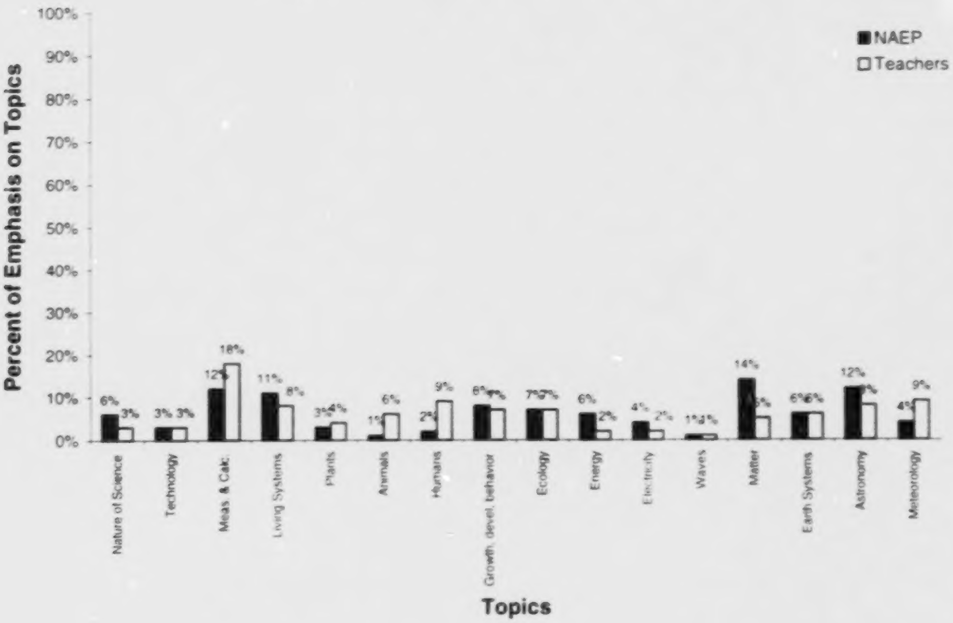

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EXHIBIT D.4d

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Emphasis on Topics – Middle School Science (n=41)

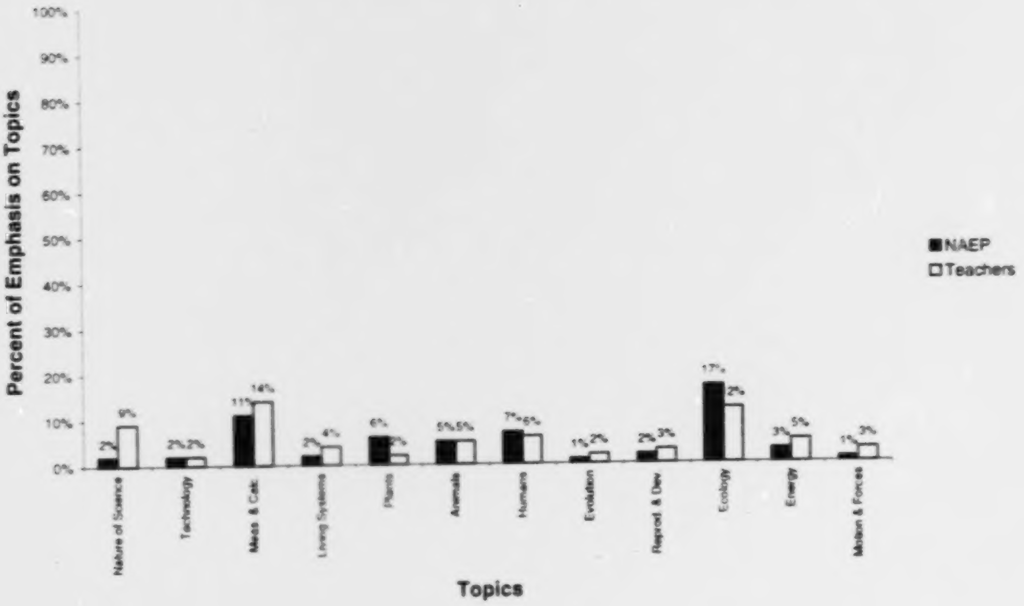

EXHIBIT D.4d (Continued)

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Emphasis on Topics – Middle School Science (n=41)

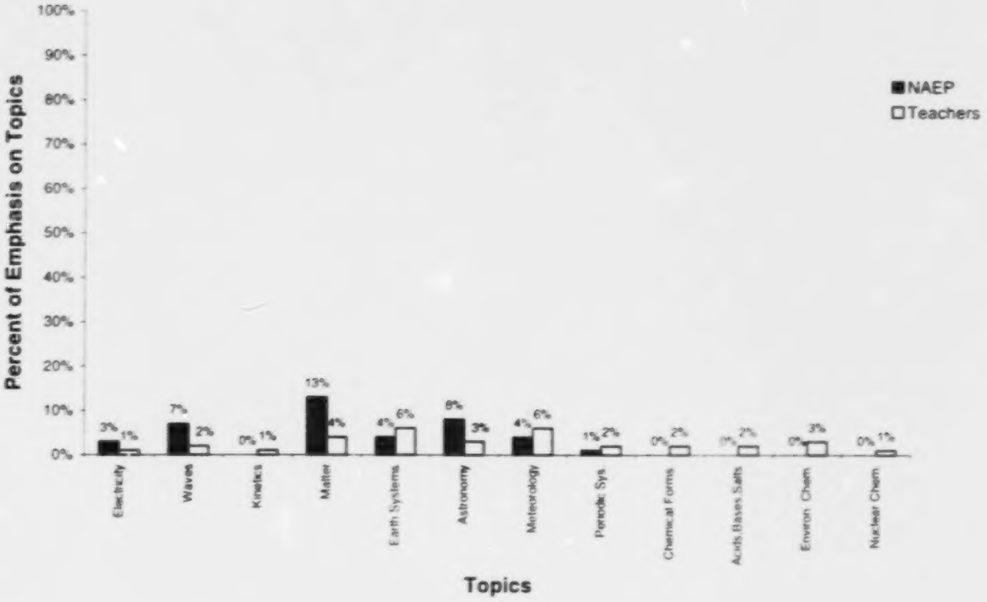

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EXHIBIT D.4e

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Emphasis on Topics – High School Science (n=64)

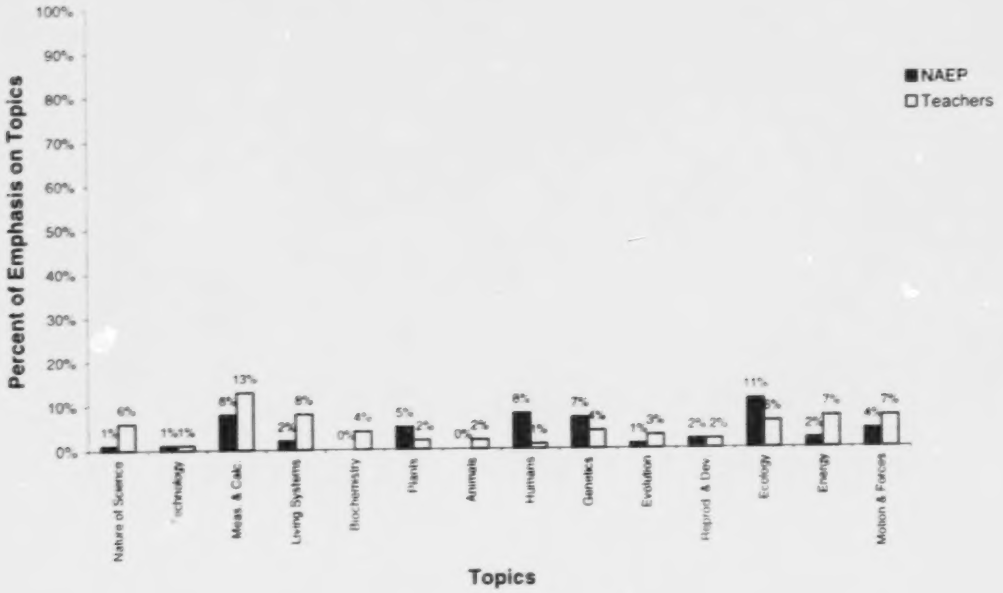
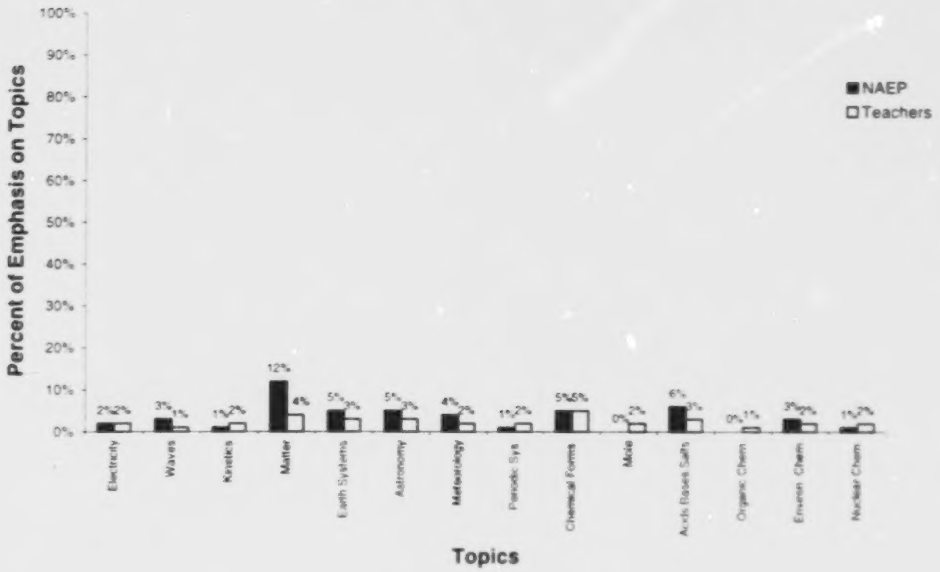


EXHIBIT D.4e (Continued)

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Emphasis on Topics – High School Science (n=64)



Performance goals and high standards. In Exhibit 2.6, we described the performance goals teachers hold for students, using elementary school mathematics teachers as an example. Here we present the performance goals of teachers for the remaining five subgroups: middle and high school mathematics; and elementary, middle, and high school science.

EXHIBIT D.5a

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Emphasis on Performance Goals - Middle School Math (n=38)

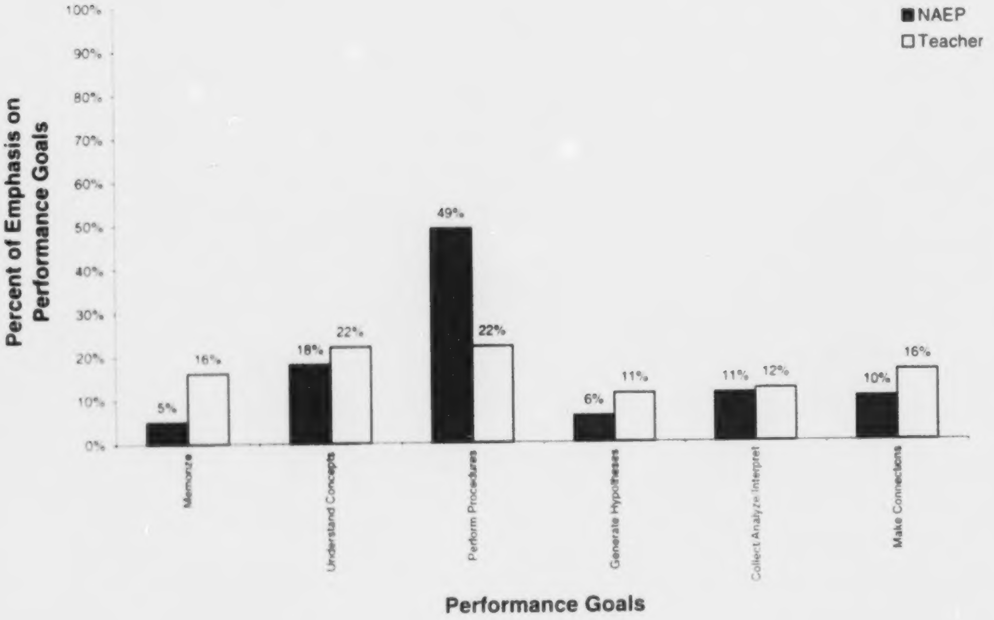


EXHIBIT D.5b

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Emphasis on Performance Goals – High School Math (n=69)

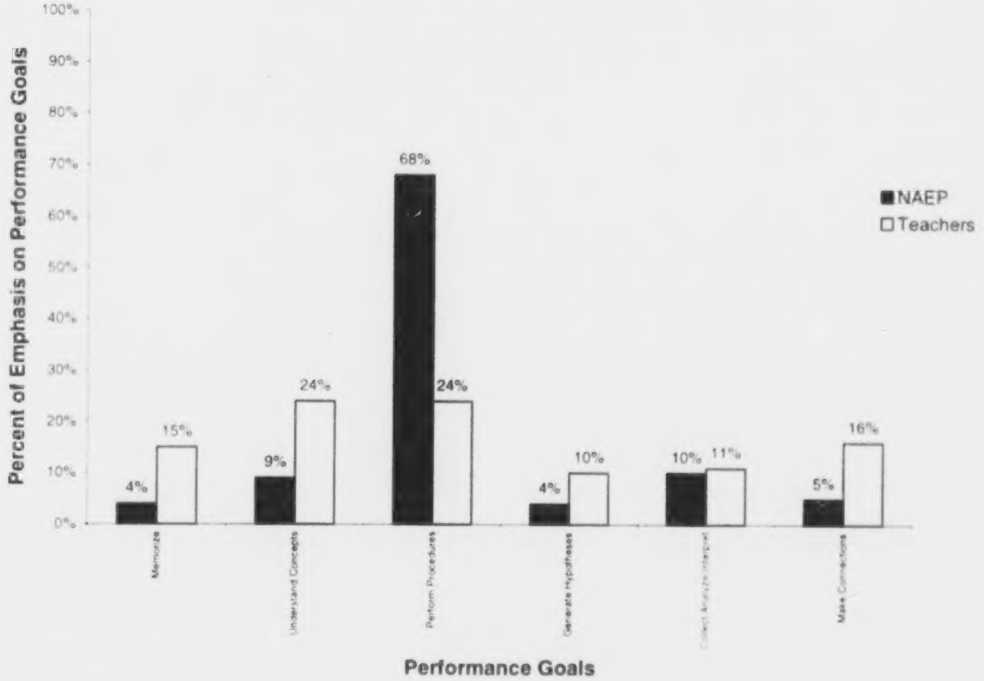


EXHIBIT D.5c

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Relative Emphasis on Performance Goals – Elementary School Science (n=69)

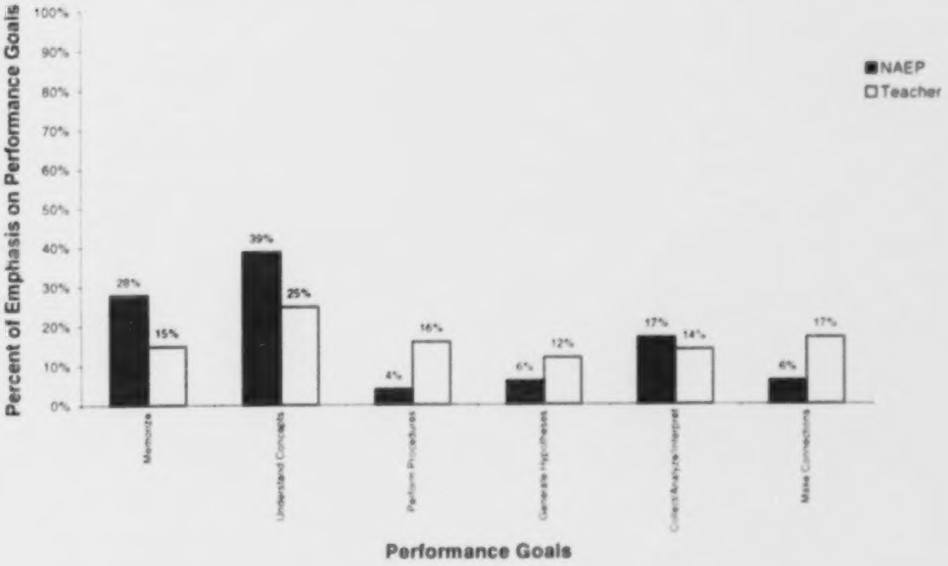


EXHIBIT D.5d

Comparison of NAEP and Teachers on the Longitudinal Teacher Survey on Emphasis on Performance Goals – Middle School Science (n=41)

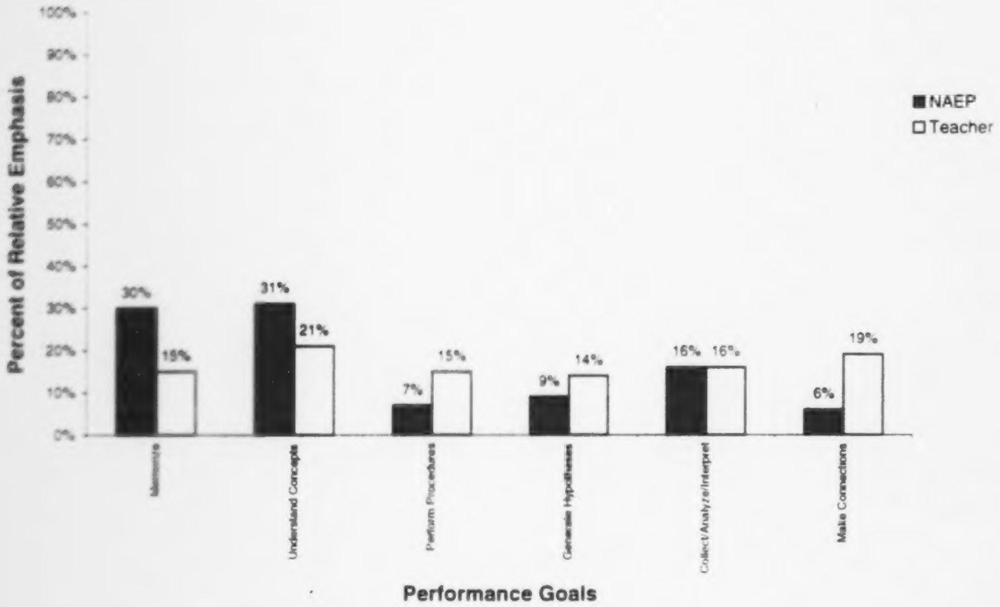


EXHIBIT D.5e

Comparison of NAEP and Teachers in the Longitudinal Teacher Survey on Emphasis on Performance Goals – High School Science (n=64)

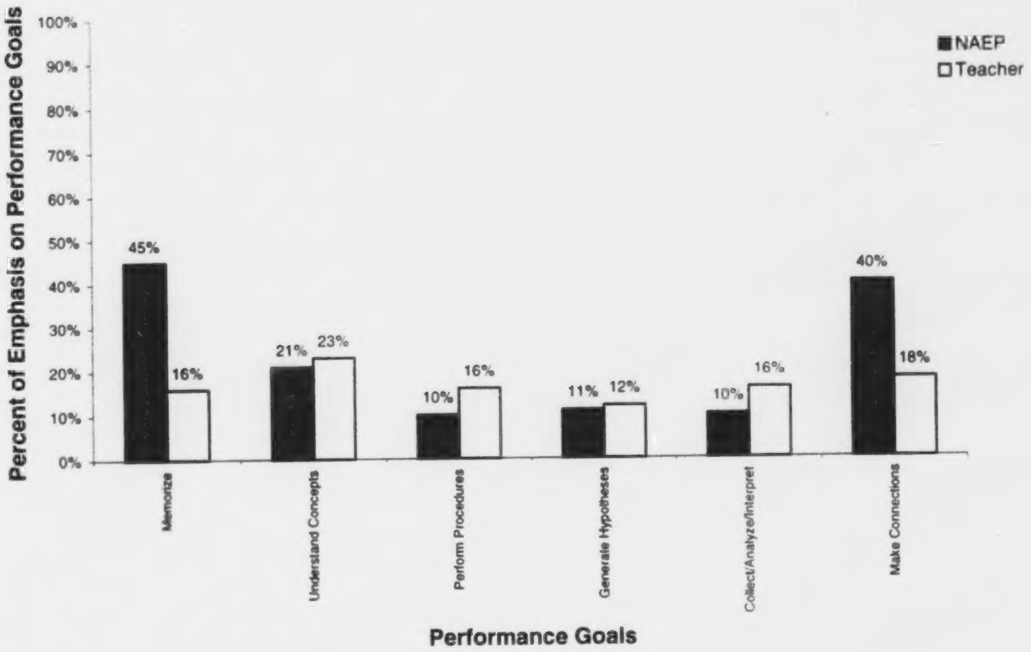


Exhibit 2.7 in Chapter 2 displays significant differences in performance goals among schools and types of teachers. We conducted MANOVAs to determine whether school level (i.e., elementary, middle, high school), subject (i.e., mathematics or science), or poverty level of the school affects the types of performance expectations teachers held for students. The results are shown in Exhibit D.6, below.

EXHIBIT D.6

Effects of School Level, Subject, and Poverty on Teachers' Emphasis on Performance Goals F-Values, Tukey Pairwise Contrasts, and df (n=355)

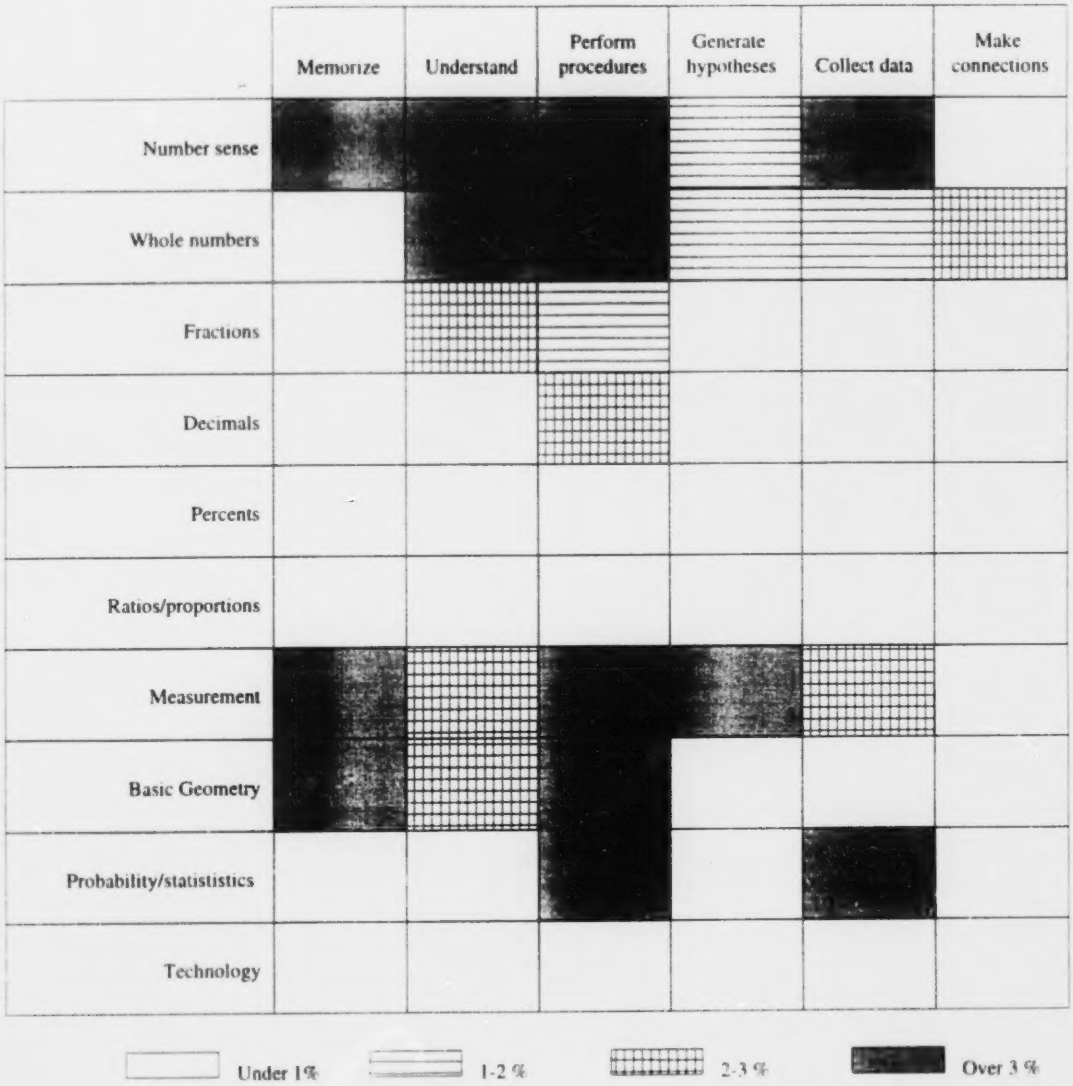
	Memorize	Understand Concepts	Perform Procedures	Generate Hypothesis	Collect/ Analyze/ Interpret	Make Connections
School Level	0.23 (df=2, 349)	1.61 (df=2, 349)	4.78** (df=2, 349)	1.55 (df=2, 349)	0.51 (df=2, 349)	0.74 (df=2, 349)
HS-MS	0.00 (df=349)	0.02 (df=349)	0.02* (df=349)	-0.02* (df=349)	-0.01 (df=349)	-0.01 (df=349)
HS-ES	-0.00 (df=349)	-0.00 (df=349)	0.02* (df=349)	-0.01 (df=349)	-0.00 (df=349)	-0.00 (df=349)
MS-ES	-0.00 (df=349)	-0.02 (df=349)	0.00 (df=349)	0.01 (df=349)	0.01 (df=349)	0.00 (df=349)
Subject	0.19 (df=1, 349)	0.25 (df=1, 349)	131.75*** (df=1, 349)	9.88** (df=1, 349)	26.94*** (df=1, 349)	6.28** (df=1, 349)
School Poverty Level	4.34* (df=1,349)	6.45* *(df=1,349)	0.62 (df=1,349)	2.16 (df=1,349)	1.31 (df=1,349)	0.22 (df=1,349)

* Significant at p<.05
** Significant at p<.01
*** Significant at p<.001

Content emphasis and high standards. Chapter 2, Exhibit 2.9, shows the relative emphasis teachers and the NAEP place on content areas for elementary school science. Here, we display the same information for the remaining five subgroups: elementary, middle, and high school mathematics; and middle and high school science.

EXHIBIT D.7a

Emphasis on Content Areas in Fourth-Grade Math NAEP Items

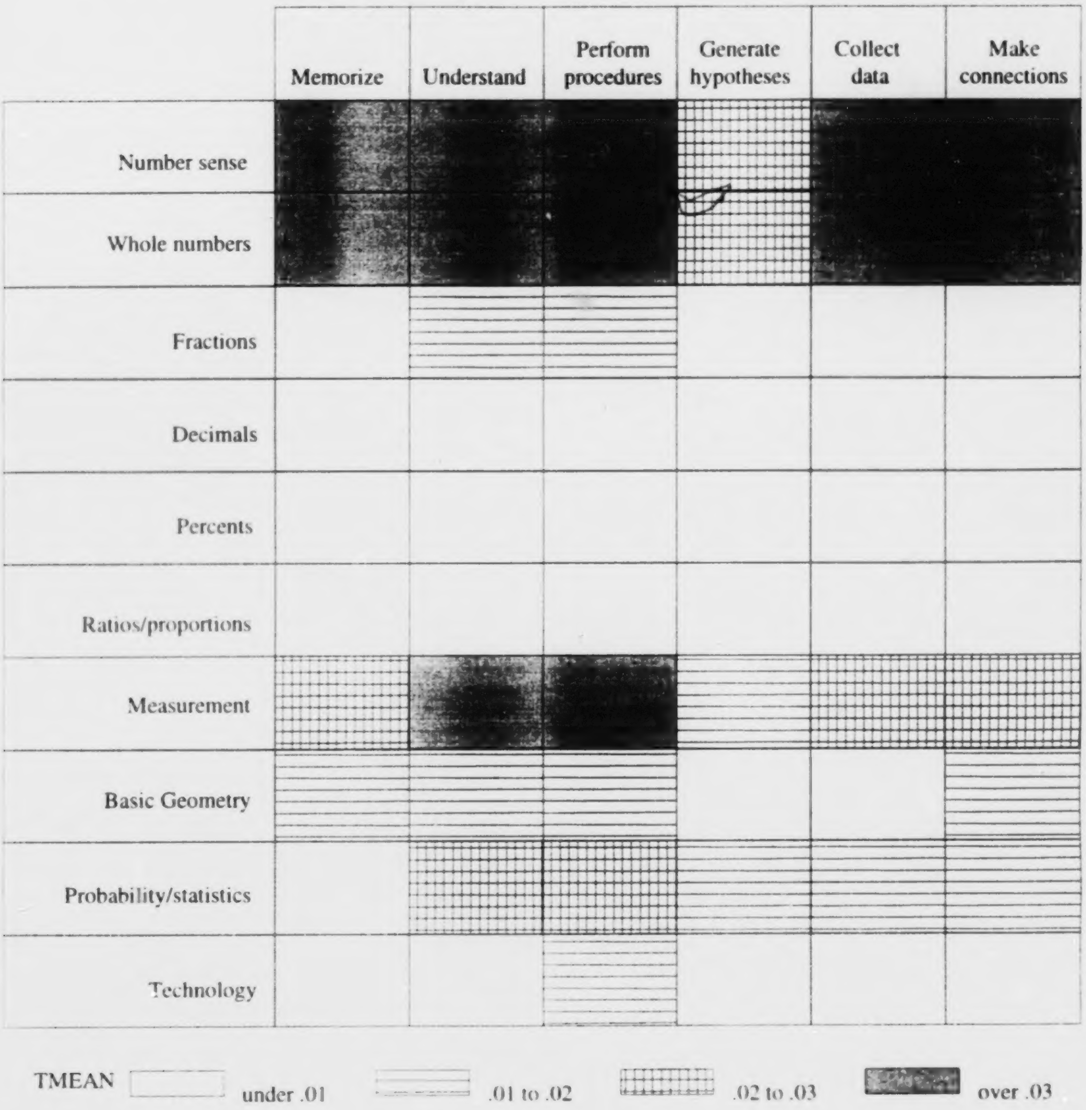


	Memorize	Understand	Perform procedures	Generate hypotheses	Collect data	Make connections
Number sense	■	■	■	▤	■	□
Whole numbers	□	■	■	▤	▤	▦
Fractions	□	▦	▤	□	□	□
Decimals	□	□	▦	□	□	□
Percents	□	□	□	□	□	□
Ratios/proportions	□	□	□	□	□	□
Measurement	■	▦	■	■	▦	□
Basic Geometry	■	▦	■	□	□	□
Probability/statistics	□	□	■	□	■	□
Technology	□	□	□	□	□	□

□ Under 1% ▤ 1-2 % ▦ 2-3 % ■ Over 3 %

EXHIBIT D.7b

Emphasis on Content Areas, Reported by Elementary School Math Teachers in the Longitudinal Teacher Survey (n=74)



	Memorize	Understand	Perform procedures	Generate hypotheses	Collect data	Make connections
Number sense	■	■	■	▦	■	■
Whole numbers	■	■	■	▦	■	■
Fractions	□	▤	▤	□	□	□
Decimals	□	□	□	□	□	□
Percents	□	□	□	□	□	□
Ratios/proportions	□	□	□	□	□	□
Measurement	▦	■	■	▤	▦	▦
Basic Geometry	▤	▤	▤	□	□	▤
Probability/statistics	□	▦	▦	▤	▤	▤
Technology	□	□	▤	□	□	□

TMEAN □ under .01 ▤ .01 to .02 ▦ .02 to .03 ■ over .03

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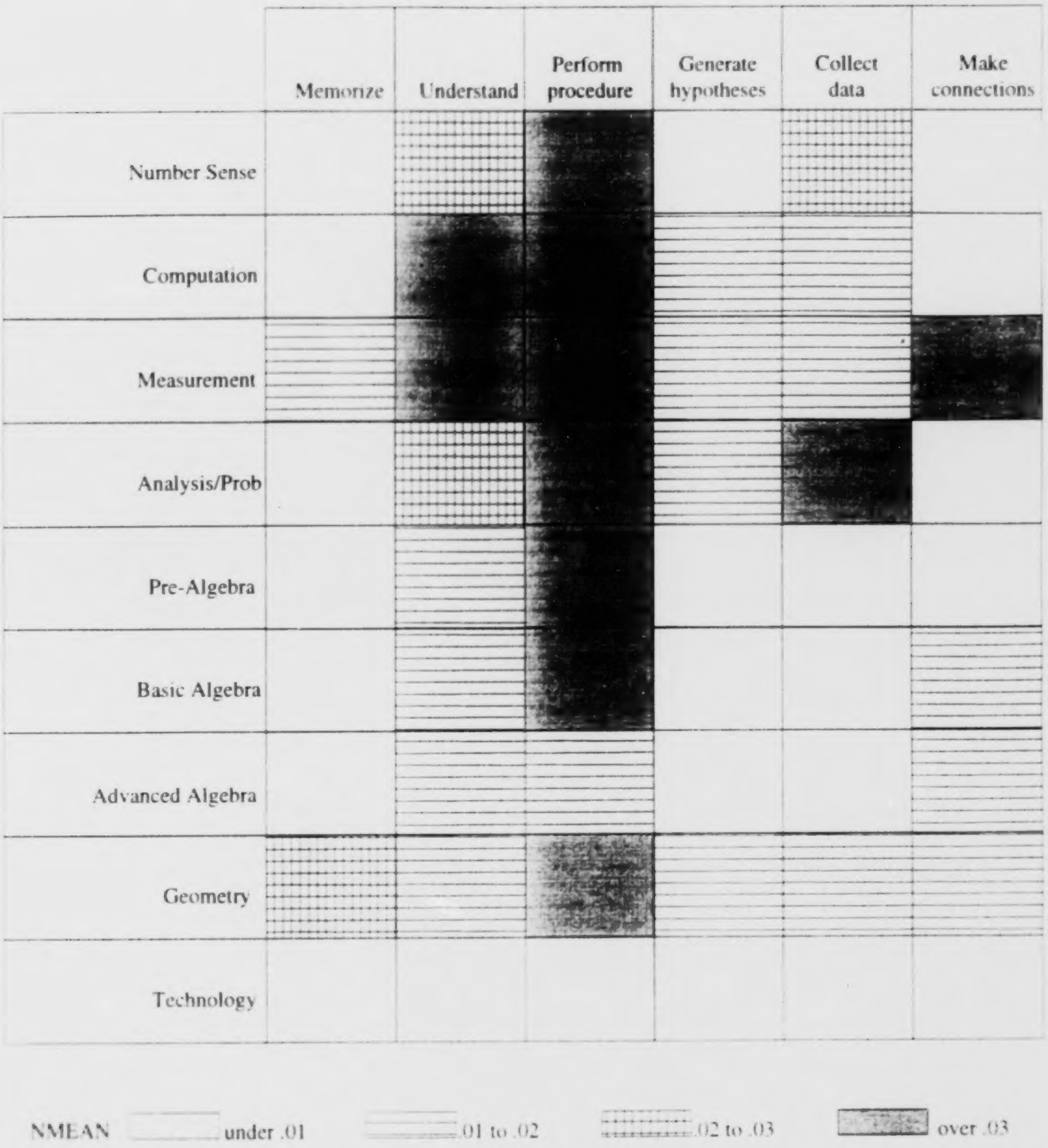
EXHIBIT D.7c

Emphasis on Content Areas in Eighth-Grade Math NAEP Items



	Memorize	Understand	Perform procedure	Generate hypotheses	Collect data	Make connections
Number Sense		▦	■		▦	
Computation		■	■	▤	▤	
Measurement	▤	■	■	▤	▤	■
Analysis/Prob		▦	■	▤	■	
Pre-Algebra		▤	■			
Basic Algebra		▤	■			▤
Advanced Algebra		▤	▤			▤
Geometry	▦	▤	■	▤	▤	▤
Technology						

NMEAN ☐ under .01 ▤ .01 to .02 ▦ .02 to .03 ■ over .03

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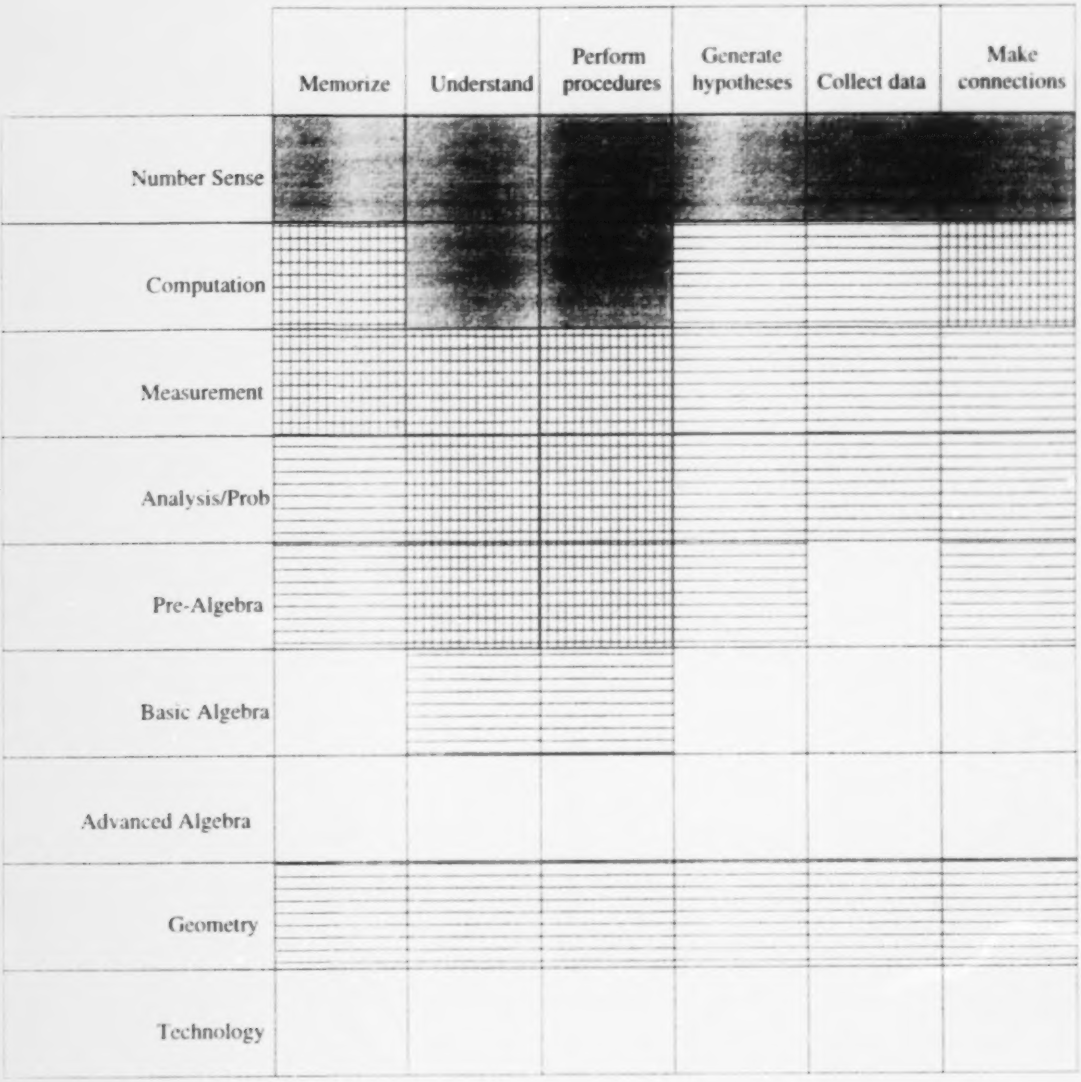
EXHIBIT D.7d

Emphasis on Content Areas, Reported by Middle School Math Teachers in the Longitudinal Teacher Survey (n=38)



	Memorize	Understand	Perform procedures	Generate hypotheses	Collect data	Make connections
Number Sense	■	■	■	■	■	■
Computation	▦	■	■	▤	▤	▦
Measurement	▦	▦	▦	▤	▤	▤
Analysis/Prob	▤	▦	▦	▤	▤	▤
Pre-Algebra	▤	▦	▦	▤	□	▤
Basic Algebra	□	▤	▤	□	□	□
Advanced Algebra	□	□	□	□	□	□
Geometry	▤	▤	▤	▤	▤	▤
Technology	□	□	□	□	□	□

TMEAN □ under .01 ▤ .01 to .02 ▦ .02 to .03 ■ over .03

EXHIBIT D.7e

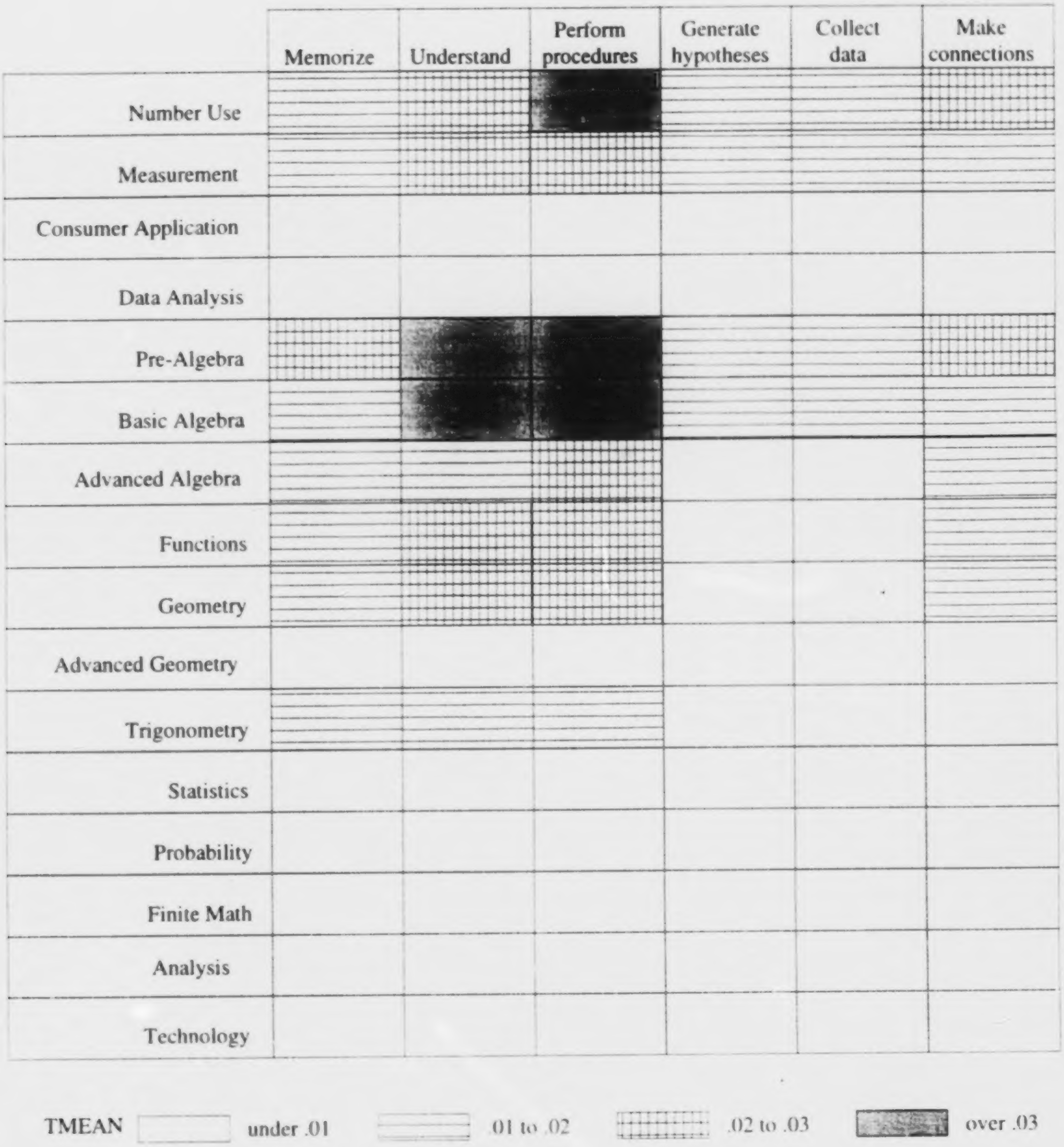
Emphasis on Content Areas in Twelfth-Grade Math NAEP Items

	Memorize	Understand	Perform procedures	Generate hypotheses	Collect data	Make connections
Number Use		■	■		▤	
Measurement		▤	■	▤	▤	▤
Consumer Application			▤			
Data Analysis		▤	■		■	
Pre-Algebra			■			
Basic Algebra			▦			
Advanced Algebra			▦			
Functions		▤	■			
Geometry	▤		■	▤		
Advanced Geometry			▤			
Trigonometry			▤			
Statistics			▤			
Probability			■			
Finite Math			▤			
Analysis						▤
Technology						

NMEAN ☐ under .01 ▤ .01 to .02 ▦ .02 to .03 ■ over .03

EXHIBIT D.7f

Emphasis on Content Areas, Reported by High School Math Teachers in the Longitudinal Teacher Survey (n=69)



	Memorize	Understand	Perform procedures	Generate hypotheses	Collect data	Make connections
Number Use	▤	▦	■	▤	▤	▦
Measurement	▤	▦	▦	▤	▤	▤
Consumer Application	□	□	□	□	□	□
Data Analysis	□	□	□	□	□	□
Pre-Algebra	▦	■	■	▤	▤	▦
Basic Algebra	▤	■	■	▤	▤	▤
Advanced Algebra	▤	▤	▦	□	□	▤
Functions	▤	▦	▦	□	□	▤
Geometry	▤	▦	▦	□	□	▤
Advanced Geometry	□	□	□	□	□	□
Trigonometry	▤	▤	▤	□	□	□
Statistics	□	□	□	□	□	□
Probability	□	□	□	□	□	□
Finite Math	□	□	□	□	□	□
Analysis	□	□	□	□	□	□
Technology	□	□	□	□	□	□

TMEAN □ under .01 ▤ .01 to .02 ▦ .02 to .03 ■ over .03

EXHIBIT D.7g

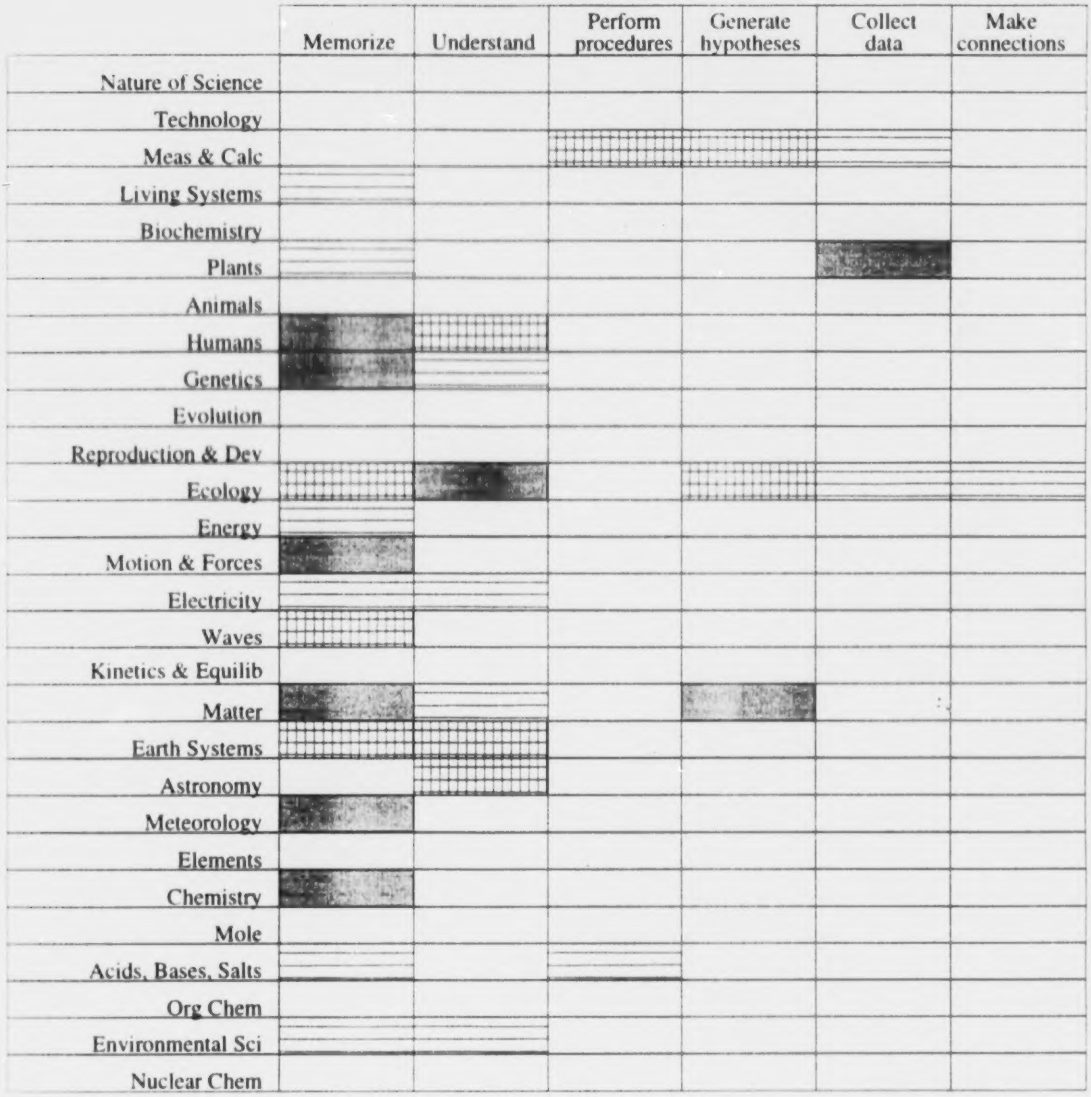
Emphasis on Content Areas in Eighth-Grade Science NAEP Items

	Memorize	Understand	Perform procedures	Generate hypotheses	Collect data	Make connections
Nature of Science						
Technology						▤
Measurement		■	■		■	
Living Systems	▤					
Plants		▦			▤	
Animals	▤			▤		
Humans	■	▦				
Evolution						
Reproduction						
Ecology	▦	■		▦	▦	■
Energy	▤					
Motion & Forces						
Electricty	▦					
Waves	■	▦				
Kinetics & Equilibri						
Properties of Matter	▦	▦	▤	▦	■	
Earth Systems	■					
Astronomy		■				
Meteorology	▤	▤				
Elements						
Chem Formulas & Reac						
Acids, Bases, Salts						
Environmental Chemis						
Nuclear Chemistry						

NMEAN ☐ under .01 ▤ .01 to .02 ▦ .02 to .03 ■ over .03

EXHIBIT D.7h

Emphasis on Content Areas in Middle School Science, Reported in the Longitudinal Teacher Survey (n=41)



	Memorize	Understand	Perform procedures	Generate hypotheses	Collect data	Make connections
Nature of Science						
Technology						
Meas & Calc			▦	▦	▤	
Living Systems	▤					
Biochemistry						
Plants	▤				■	
Animals						
Humans	■	▦				
Genetics	■	▤				
Evolution						
Reproduction & Dev						
Ecology	▦	■		▦	▤	▤
Energy	▤					
Motion & Forces	■					
Electricity	▤	▤				
Waves	▦					
Kinetics & Equilib						
Matter	■	▤		■		
Earth Systems	▦	▦				
Astronomy		▦				
Meteorology	■					
Elements						
Chemistry	■					
Mole						
Acids, Bases, Salts	▤		▤			
Org Chem						
Environmental Sci	▤	▤				
Nuclear Chem						

NMEAN ☐ under .01 ▤ .01 to .02 ▦ .02 to .03 ■ over .03

EXHIBIT D.7i
Emphasis on Content Areas in Twelfth-Grade Science NAEP Items

	Memorize	Understand	Perform procedures	Generate hypotheses	Collect data	Make connections
Nature of Science	▤	▤	▤	▤	▤	▤
Technology						
Measurement	▤	▦	▦	▤	▦	▦
Living Systems						
Plants						
Animals		▤				
Humans	▤	▤				▤
Evolution						
Reproduction						
Ecology	▤	▦	▤	▤	▦	▦
Energy						
Motion & Forces						
Electricty						
Waves						
Kinetics & Equilibri						
Properties of Matter						
Earth Systems		▤				▤
Astronomy						
Meteorology		▤				▤
Elements						
Chem Formulas & Reac						
Acids, Bases, Salts						
Environmental Chemis						
Nuclear Chemistry						

TMEAN ☐ under .01 ▤ .01 to .02 ▦ .02 to .03

EXHIBIT D.7j

Emphasis on Content Areas, Reported by High School Science Teachers in the Longitudinal Teacher Survey (n=64)

	Memorize	Understand	Perform procedures	Generate hypotheses	Collect data	Make connections
Nature of Science		▤				▤
Technology						
Meas & Calc	▦	▦	▦	▤	▦	▤
Living Systems	▤	▤	▤		▤	▤
Biochemistry						
Plants						
Animals						
Humans						
Genetics						
Evolution						
Reproduction & Dev						
Ecology		▤				▤
Energy		▤	▤		▤	▤
Motion & Forces	▤	▤	▤		▤	▤
Electricity						
Waves						
Kinetics & Equilib						
Matter		▤				
Earth Systems						
Astronomy						
Meteorology						
Elements						
Chemistry	▤	▤				
Mole						
Acids, Bases, Salts						
Org Chem						
Environmental Sci						
Nuclear Chem						

TMEAN ☐ under .01 ▤ .01 to .02 ▦ .02 to .03

Alignment between content emphases and high standards. Exhibit 2.10 in Chapter 2 displays the degree of alignment between teachers' instructional emphases and NAEP emphases. Here, Exhibit D.8 provides the means and standard deviations for the graphic representation of alignment in Exhibit 2.10.

EXHIBIT D.8

Alignment between Teachers' Instruction and NAEP Emphasis (n=355)

	Mathematics			Science		
Index	**Elementary School**	**Middle School**	**High School**	**Elementary School**	**Middle School**	**High School**
Mean	27.1	28.8	19.2	14.7	15.0	11.5
Standard Deviation	10.8	7.5	6.0	8.2	5.0	3.6

To better understand the conditions under which teachers' instruction aligned with NAEP, we examined the relationship between alignment and the following factors.

- *School level:* Is there a difference among elementary, middle, and high school teachers in their alignment to NAEP? Using the general linear models procedure with our sample of 354 teachers, across three types of schools, we found that alignment differs by school level (F=16.55***, df=2, 351).

- *Subject:* Is there a difference between mathematics and science teachers? Using the general linear models procedure with our sample of 354 teachers, across two subjects, we found that alignment differs by subject (F=159.56***, df=1, 352).

- *Specific schools:* Is there a difference among schools in how well teachers' instruction is aligned with NAEP? Using the general linear models procedure with our sample of 354 teachers, in 29 schools, we found that schools differ significantly in how well their teachers' instruction aligns with NAEP (F=2.10**, df=28, 325).

- *Grade level:* For example, is there a difference among ninth-, tenth-, eleventh-, and twelfth-grade science teachers in how well their instruction is aligned with NAEP? We used the general linear models procedure to examine this question within each subgroup (e.g., high school science). We found that, with the exception of elementary school mathematics, alignment does not differ much across grades within schools at the same level (i.e., elementary, middle, or high; see Exhibit D.9).

- *School poverty level:* Is there a difference among teachers in high poverty versus low poverty schools in how well their instruction aligns with NAEP? We used the general linear models procedure to examine this question within each subgroup (e.g., high school science). We found that alignment does not differ much between high- and low-poverty schools (see Exhibit D.9).

EXHIBIT D.9

Effects of Grade Level and Subject on Alignment between Teachers' and NAEP's Content Emphases MANOVA Tests: F-Values and Degrees of Freedom (df) (n=355)

	Mathematics			Science		
	Elementary School	**Middle School**	**High School**	**Elementary School**	**Middle School**	**High School**
Grade Level	24.93***	.19	2.18	1.91	.55	1.12
	df=5, 62	df=2, 35	df=3, 65	df=5, 58	df=2, 37	df=4, 57
School Poverty	.42	4.07	.11	.34	.87	.39
	df=1, 72	df=1, 36	df=1, 67	df=1, 66	df=1, 39	df=1, 62

* Significant at p<.05
** Significant at p<.01
*** Significant at p<.001

PEDAGOGY AND HIGH STANDARDS

In the sections below, we discuss the scales measuring pedagogical approaches discussed in Chapter 2, and we then present several results that supplement the material in the chapter.

Pedagogical approaches

We conducted analyses on a series of items in the longitudinal survey about teachers' pedagogical strategies. (See Exhibit D.10 for the items involved.)

EXHIBIT D.10

Pedagogy Questions Drawn from Middle School Mathematics Survey

1. Indicate the percentage of time in the target class you spent on math instruction in each of the following activities. (Note: Total should sum to 100%.)

Teacher Activities	Percent of Instr. Time
a. Lecturing to the class....................................	________
b. Providing demonstrations to the class (including lab demonstrations).....................................	________
c. Leading whole class discussions.......................	________
d. Working with students in small groups...............	________
e. Working with students individually..	________
f. Performing routine administrative tasks (e.g., taking attendance, making announcements, etc.)..................................	________
g. Helping students with experiments, projects, or other hands-on experiences	________
h. Other: (please specify) ____________________	________
TOTAL	100%

2. Indicate the percentage of class time spent on math instruction that the typical student is engaged in each of the following activities. (Note: Total should sum to 100%.)

Student Activities	Percent of Instr. Time
a. Listening/taking notes/observing demonstrations................................	________
b. Engaged in discussion..	________
c. Doing lab or field work..	________
d. Completing exercises/taking a test or quiz...	________
e. Reading..	________
f. Completing a performance task, writing..................	________
g. Presenting material to the class.............................	________
h. Other: (please specify) ______________________	________
TOTAL	100%

EXHIBIT D.10 (Continued)

Pedagogy Questions Drawn from Middle School Mathematics Survey

3. How often did you have students (during math): (Circle one for each line.)

	Almost Never	Some Lessons	Most Lessons	Every Lesson
a. Work on or review homework in class	0	1	2	3
b. Work on paper-and-pencil exercises related to the topic	0	1	2	3
c. Work on independent, long-term (at least one-week) projects	0	1	2	3
d. Work on problems for which there is no immediately obvious method or solution	0	1	2	3
e. Develop technical or mathematical writing skills, including using equations, graphs, tables, and text together	0	1	2	3
f. Work on interdisciplinary lessons (e.g., writing journals in class)	0	1	2	3
g. Recite or drill orally	0	1	2	3
h. Debate ideas or otherwise explain their reasoning	0	1	2	3
i. Complete a short test or quiz to review previous lesson	0	1	2	3
j. Use concrete models or manipulatives	0	1	2	3

4. About how often did students use the following as part of math instruction: (Circle one for each line.)

	Almost Never	Some Lessons	Most Lessons	Every Lesson
a. Standard calculators to solve basic exercises or problems	0	1	2	3
b. Programmable calculators to solve advanced exercises or problems	0	1	2	3
c. Graphing calculators to graph equations or data	0	1	2	3
d. Calculators or computers to develop models or simulations	0	1	2	3
e. Calculators or computers for data collection and analysis	0	1	2	3
f. Computers for drill and practice on skill acquisition				
g. Computers to write reports	0	1	2	3
h. Computers to access the internet	0	1	2	3

EXHIBIT D.10 (Continued)

Pedagogy Questions Drawn from Middle School Mathematics Survey

6. About how often did you interact with students in the targeted class in the following ways: (Circle one for each line.)

	Almost Never	Some Lessons	Most Lessons	Every Lesson
a. Students work individually without your ongoing assistance	0	1	2	3
b. Students work individually with your ongoing assistance	0	1	2	3
c. Work together as a class with students responding to one another	0	1	2	3
d. Work in pairs or small groups without your ongoing assistance	0	1	2	3
e. Work in pairs or small groups with your ongoing assistance	0	1	2	3

7. How important were the following assessment strategies in determining students' grades in this math class: (Circle one for each line.)

	Not Used	Minor Importance	Moderate Importance	Very Important
a. Objective tests (e.g., multiple choice)	0	1	2	3
b. Essay tests	0	1	2	3
c. Performance tasks or events	0	1	2	3
d. Systematic observation of students	0	1	2	3
e. Math reports	0	1	2	3
f. Math projects	0	1	2	3
g. Homework assignments	0	1	2	3
h. Portfolios	0	1	2	3

To identify patterns in teachers' pedagogical activities, we conducted factor analyses on the full set of items identified in Exhibit D.10. The following four factors, consistent with research on pedagogy, emerged.

Didactic instruction. (alpha reliability=.75).

- Students working on interdisciplinary lessons (reverse coded)
- Students using concrete models or manipulatives (reverse coded)
- Teacher lecturing to class
- Teacher working with students in small groups (reverse coded)
- Students listening/taking notes/observing demonstration
- Students reading (reverse coded)
- Students completing a performance task, writing (reverse coded)
- Students presenting material to the class (reverse coded)

Individual Seatwork. (alpha reliability=.69).

- Students working on or reviewing homework in class
- Students working on paper-and-pencil exercises related to the topic
- Students reciting or drilling orally
- Students completing a short test or quiz to review previous lesson
- Students work individually without your ongoing assistance
- Students work individually with your ongoing assistance
- Students work in pairs or small groups without your ongoing assistance

Active, project-centered instruction. (alpha reliability=.67).

- Students working on independent, long-term projects
- Students working on problems for which there is no immediately obvious method or solution
- Students developing technical or mathematical/scientific writing skills
- Teacher working with students individually (reverse coded)

- Teacher helping students with experiments, projects, or other hands-on experiences
- Students doing lab or field work
- Students completing exercises/taking a test or quiz (reverse coded)
- Students doing other (reverse coded)

Discussion-oriented instruction. (alpha reliability=.67).

- Teacher leading whole class discussion
- Students engaging in discussion

Exhibit 2.13 in Chapter 2 displays significant differences in pedagogical approaches among schools and types of teachers. Exhibit D.11 provides additional information concerning the ANOVA results.

EXHIBIT D.11

Effects of School Level and Subject on Teachers' Pedagogical Approaches F-Values, Tukey Pairwise Contrasts, and df (n=355)

	Traditional				Nontraditional			
	Didactic		Individual Seatwork		Active		Discussion-oriented+	
School Level	42.89***	(df=2, 352)	5.61**	(df=2, 352)	0.55	(df=2, 352)	4.23*	(df=2, 339)
HS-MS	2.86*	(df=1, 210)	1.92	(df=1, 210)	-0.25	(df=1, 210)	-1.86	(df=1, 202)
HS-ES	6.20*	(df=1, 274)	2.24*	(df=1, 274)	-0.73	(df=1, 274)	-3.07*	(df=1, 265)
MS-ES	3.34*	(df=1, 220)	0.32	(df=1, 220)	-0.48	(df=1, 220)	-1.22	(df=1, 211)
Subject	1.09	(df=1, 353)	31.67***	(df=1, 353)	50.69***	(df=1, 353)	0.37	(df=1, 340)
School Poverty Level	16.65***	(df=1, 352)	0.00	(df=1, 352)	0.01	(df=1, 352)	1.06	(df=1, 339)

+ n=342
* Significant at p<.05
** Significant at p<.01
*** Significant at p<.001

Supplementary Tables

Two of the pedagogy questions ask teachers to report the percentage of time they spend in a selected class on various activities. The results are reported in Exhibit D.12.

EXHIBIT D.12

Time Spent on Class Activities (n=339)

Percent of Time Teacher Spends on Instructional Activities

	Mean	Standard Deviation
Lecturing	19.50	14.49
Providing demonstrations	14.75	9.40
Leading whole-class discussion	15.02	10.95
Working with students in small groups	15.90	10.60
Working with students individually	12.11	9.34
Performing routine administrative tasks	4.67	4.71
Helping students with hands-on experiences*	17.29	13.84
Other*	0.71	2.98

* n=340

Percent of Time Students Spend on Learning Activities

	Mean	Standard Deviation
Listening/taking notes/observing*	25.91	16.25
Engaged in discussion	16.07	9.68
Doing lab or field work	16.30	14.84
Completing exercises/taking a test or quiz	15.17	11.62
Reading	6.90	6.54
Completing a performance task, writing*	12.22	9.19
Presenting material*	6.56	6.55
Other	0.71	3.49

* n=338

APPENDIX E

SUPPLEMENT FOR CHAPTER 3

This appendix provides supplementary information for the analyses reported in Chapter 3. Each Exhibit in the appendix corresponds to an Exhibit of the same number in Chapter 3. The boxes at the bottom of each Exhibit refer to the Teacher Activity Survey item numbers or composite variables on which the exhibit is based. Teacher Activity Survey item numbers begin with the letter "A," followed by the section of the survey and the item involved. For example, item number "A3_24a" refers to section 3, item 24a of the survey. All items referred to in the chapter appear at the end of this appendix, in Exhibit 3.21d. Composite variables, which appear in all-capital letters (for example, ALEARN_T), are defined in Exhibit 3.21b. Due to missing data caused by teacher nonresponse to particular survey questions, the number of teacher responses varies across survey items.

EXHIBIT E.3.1

Percent of Teachers Reporting Participation in Traditional and Reform Types of Eisenhower-assisted Professional Development Activities (District n=775, SAHE Grantee n=244)

	District	SAHE Grantee
In-District Workshop or Institute	52.06	22.93
College Course	4.41	26.09
Out-of-District Workshop or Institute	15.12	25.34
Out-of-District Conference	7.60	.31
Collaborative or Network	5.54	7.96
Study Group	1.04	2.92
Mentoring	3.70	7.90
Committee or Task Force	8.53	1.80
Internship	.69	2.58
Resource Center	1.32	2.16

Source: Mail Survey of Teachers Participating in Eisenhower supported Professional Development Activities, 1998
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Variables: A3_2CAT (A3_2 with "other" responses categorized into standard response options)

EXHIBIT E.3.2

Contact Hours Provided by Eisenhower-assisted Professional Development Activities, as Reported by Teachers (District n=767, SAHE Grantee n=244)

	Mean	*SD*	*n*	*F*	*df*	*p*
Program Component				51.28	1, 1007	0.00
District	25.44	(35.16)	767			
SAHE Grantee	51.10	(39.34)	244			
Type				2.37	1, 1007	0.12
Traditional	29.57	(34.22)	804			
Reform	38.51	(48.75)	207			
Program Component * Type				5.46	1, 1007	0.02
District * Traditional	22.74	(28.97)	609			
District * Reform	34.58	(51.58)	158			
SAHE Grantee * Traditional	51.73	(40.23)	195			
SAHE Grantee * Reform	49.30	(35.86)	49			

Source: Mail Survey of Teachers Participating in Eisenhower supported Professional Development Activities, 1998
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Variables: A3_10_12 =(A3_10+A3+12)

EXHIBIT E.3.3

Time Span of Eisenhower-assisted Activities, as Reported by Teachers (District n=766, SAHE Grantee n=244)

	Mean	SD	n	F	df	p
Program Component				44.36	1, 1007	0.00
District	3.98	(2.21)	767			
SAHE Grantee	5.61	(2.09)	244			
Type				9.52	1, 1007	0.00
Traditional	4.20	(2.24)	804			
Reform	5.07	(2.34)	207			
Program Component * Type				7.08	1, 1007	0.01
District * Traditional	3.76	(2.11)	609			
District * Reform	4.89	(2.36)	158			
SAHE Grantee * Traditional	5.59	(2.07)	195			
SAHE Grantee * Reform	5.67	(2.21)	49			

Source: Mail Survey of Teachers Participating in Eisenhower supported Professional Development Activities, 1998
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Variables: Time Span

EXHIBIT E.3.4

Percent of Teachers Reporting School-level and Department or Grade-level Participation in Eisenhower-assisted Professional Development Activities (District n=783, SAHE Grantee n=244)

Collective Participation	District	SAHE Grantee
All teachers in department or grade level	19.84	7.18
All teachers in school	18.59	10.75

Source: Mail Survey of Teachers Participating in Eisenhower supported Professional Development Activities, 1998
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Variables: A3_24c, A3_24d

EXHIBIT E.3.5

Percent of Teachers Reporting a Major Emphasis on Mathematics and Science Content Knowledge in Eisenhower-assisted Professional Development Activities (District n=754, SAHE Grantee n=243)

	Mean	*SD*	*n*	*F*	*df*	*p*
Program Component				21.35	1, 993	0.00
District	1.36	(0.72)	754			
SAHE Grantee	1.63	(0.57)	243			
Type				1.39	1, 993	0.24
Traditional	1.41	(0.69)	794			
Reform	1.49	(0.72)	203			
Program Component * Type				0.01	1, 993	0.91
District * Traditional	1.34	(0.72)	600			
District * Reform	1.41	(0.74)	154			
SAHE Grantee * Traditional	1.61	(0.56)	194			
SAHE Grantee * Reform	1.69	(0.62)	49			

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Variables: D2_CO (A3_13f)

EXHIBIT E.3.6

Percent of Teachers Reporting That They Had Opportunities to Observe or Be Observed Teaching in Eisenhower-assisted Professional Development Activities (District n=783, SAHE Grantee n=244)

Types of Opportunities to Observe and Be Observed Teaching	District	SAHE Grantee
Teacher received coaching	9.63	21.58
Leader observed teacher teaching	4.56	16.49
Others observed teacher teaching	10.11	15.17
Teacher's classroom observed	5.30	21.56

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Variables: A3_6b, A3_6d, A3_6e, A3_35d

EXHIBIT E.3.7

Percent of Teachers Reporting Opportunities to Plan Classroom Implementation in Eisenhower-assisted Professional Development Activities

(District n=783, SAHE Grantee n=244)

Types of Opportunities to Plan Classroom Implementation	District	SAHE Grantee
Practiced in simulated conditions	28.95	38.11
Held formal meetings	31.97	50.53
Communicated with leader	36.35	53.51
Held informal meetings	46.70	52.64
Developed lesson plans	29.49	46.43

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Variables: A3_6a, A3_6c, A3_6f, A3_6h, A3_6i

EXHIBIT E.3.8

Percent of Teachers Reporting Opportunities to Examine Student Work in Eisenhower-assisted Professional Development Activities

(District n=783, SAHE Grantee n=244)

Types of Opportunities to Examine Student Work	District	SAHE Grantee
Teacher reviewed student work	18.85	26.40
Scored assessments	9.42	13.10
Leader/others reviewed student work	11.36	17.84
Student outcomes evaluated	9.07	12.19

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Variables: A3_27m, A3_27n, A3_6g, A3_35e

EXHIBIT E.3.9

Percent of Teachers Reporting Opportunities to Present, Lead, and Write in Eisenhower-assisted Professional Development Activities
(District n=783, SAHE Grantee n=244)

Types of Opportunities to Present, Lead, and Write	District	SAHE Grantee
Gave lecture or presentation	18.27	42.32
Conducted a demonstration	24.03	42.58
Led a whole-group discussion	8.33	9.89
Led a small-group discussion	16.58	20.83
Wrote a report	14.75	43.97

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
opportunity to give a lecture or presentation. Each bar and the number on the top of it represent the percent of teachers for each category.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Variables: A3_27e, A3_27f, A3_27g, A3_27h, A3_27j

EXHIBIT E.3.10

Number of Opportunities for Active Learning in Eisenhower-assisted Professional Development Activities, as Reported by Teachers
(District n=767, SAHE Grantee n=244)

	Mean	*SD*	*n*	*F*	*df*	*p*
Program Component				38.39	1, 1007	0.00
District	3.60	(3.49)	767			
SAHE Grantee	5.81	(3.94)	244			
Type				1.45	1, 1007	0.23
Traditional	3.96	(3.64)	804			
Reform	4.69	(3.99)	207			
Program Component * Type				3.98	1, 1007	0.05
District * Traditional	3.38	(3.36)	609			
District * Reform	4.35	(3.88)	158			
SAHE Grantee * Traditional	5.87	(3.89)	195			
SAHE Grantee * Reform	5.63	(4.20)	49			

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Scale Definition: ALEARN_T= (A3_6a + A3_6c + A3_6f + A3_6h + A3_6i) + 5/4*(A3_6b + A3_6d + A3_6e + A3_35D) + (A3_27e+A3_27f+A3_27g+A3_27h+A3_27j)
Scale Reliability: .84
Variables: ALEARN_T

EXHIBIT E.3.11

Percent of Teachers Reporting That Eisenhower-assisted Professional Development Activities are Related to Their Other Professional Development Experiences (District n=748 to 760, SAHE Grantee n=238 to 239)

Relationship to Other Experiences	District	SAHE Grantee
Consistent with goals	78.99	87.91
Build on earlier activities	35.00	38.80
Followed up with additional activities	52.88	69.56

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program. Due to missing data for some items, the district n ranges from 748 to 760 and the SAHE Grantee n ranges from 238 to 239.
Variables: A3_34a A3_34c A3_34d

EXHIBIT E.3.12

Percent of Teachers Reporting That Eisenhower-assisted Activities are Aligned with State and District Standards, Frameworks, and Assessments (District n=748 to 753, SAHE Grantee n=238)

Alignment with State and District Standards and Assessments	District	SAHE Grantee
Designed to support state and district standards	79.69	79.00
Designed to support state and district assessments	68.16	65.83

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program. Due to missing data on some items, the district n ranges from 748 to 753; the SAHE Grantee n is 238.
Variables: A3_34e A3_34f

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EXHIBIT E.3.13

Percent of Teachers Reporting That They Communicated with Other Teachers about Their Experiences in the Eisenhower-assisted Professional Development Activities (District n=783, SAHE Grantee n=244)

Types of Communication	District	SAHE Grantee
Discussed with other teachers	73.00	85.00
Discussed with administration	62.80	66.35
Communicated with teachers in other schools	40.79	54.31

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Variables: A3_31 A3_32 A3_33

EXHIBIT E.3.14

Degree to Which Eisenhower-assisted Professional Development Activities Foster Coherence, as Reported by Teachers (District n=747, SAHE Grantee n=235)

	Mean	*SD*	*n*	*F*	*df*	*p*
Program Component				10.41	1, 978	0.00
District	5.94	(1.92)	747			
SAHE Grantee	6.39	(1.95)	235			
Type				15.34	1, 978	0.00
Traditional	5.92	(1.84)	783			
Reform	6.48	(2.23)	199			
Program Component * Type				1.77	1, 978	0.18
District * Traditional	5.84	(1.83)	596			
District * Reform	6.27	(2.22)	151			
SAHE Grantee * Traditional	6.16	(1.85)	187			
SAHE Grantee * Reform	7.02	(2.15)	48			

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Scale Definition: COHERE_T=1.5*(A3_34e + A3_34f)+(A3_34a + A3_34c + A3_34d)+(A3_31 + A3_32 + A3_33)
Scale Reliability: .71
Variables: COHERE_T

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EXHIBIT E.3.15

Percent of Teachers Reporting Enhanced Knowledge and Skills Due to Participation in Eisenhower-assisted Professional Development Activities
(District n=731 to 750, SAHE Grantee n=233 to 240)

Areas of Knowledge and Skills	District	SAHE Grantee
In-depth knowledge of math/science	48.20	68.14
Curriculum	55.92	64.41
Instructional methods	62.79	79.16
Approaches to assessment	45.66	48.29
Use of technology	24.48	50.22
Approaches to diversity	26.04	35.12

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE Grantees component of the program. Due to missing data on some items, the district n for ranges from 731 to 750; the SAHE Grantee n ranges from 233 to 240.
Variables: A4_1a A4_1b A4_1c A4_1d A4_1e A4_1f

EXHIBIT E.3.16

Extent to Which Participation in Eisenhower-assisted Professional Development Activities Enhanced Knowledge and Skills, as Reported by Teachers
(District n=750, SAHE Grantee n=240)

	Mean	*SD*	*n*	*F*	*df*	*p*
Program Component				25.92	1, 986	0.00
District	3.19	(0.89)	750			
SAHE Grantee	3.59	(0.80)	240			
Type				17.41	1, 986	0.00
Traditional	3.22	(0.85)	792			
Reform	3.54	(0.97)	198			
Program Component * Type				0.05	1, 986	0.81
District * Traditional	3.12	(0.86)	600			
District * Reform	3.45	(0.95)	150			
SAHE Grantee * Traditional	3.51	(0.75)	192			
SAHE Grantee * Reform	3.81	(0.96)	48			

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Scale Definition: EKS_1=(A4_1a + A4_1b + A4_1c + A4_1d + A4_1e + A4_1f)/6
Scale Reliability: .78
Variables: EKS_1

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EXHIBIT E.3.17

Percent of Teachers Reporting Improvement in Classroom Teaching Practice Due to Participation in Eisenhower-assisted Professional Development Activities

(District n=731 to 750, SAHE Grantee n=233 to 244)

Types of Teaching Practices	District	SAHE Grantee
Curriculum	45.86	54.31
Cognitive challenge	55.00	65.68
Instructional methods	57.84	66.94
Approaches to assessment	44.73	34.90
Use of technology	29.07	45.74
Approaches to diversity	30.48	33.76

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program. Due to missing data on some items, the district n ranges from 731 to 750; the SAHE Grantee n ranges from 233 to 240.
Variables: A4_4a A4_4b A4_4c A4_4d A4_4e A4_4f

EXHIBIT E.3.18

Degree of Improvement in Classroom Teaching Practice Due to Participation in Eisenhower-assisted Professional Development Activities, as Reported by Teachers

(District n=767, SAHE Grantee n=244)

	Mean	*SD*	*n*	*F*	*df*	*p*
Program Component				5.87	1, 1007	0.02
District	1.27	(0.80)	767			
SAHE Grantee	1.44	(0.77)	244			
Type				11.67	1, 1007	0.00
Traditional	1.25	(0.77)	804			
Reform	1.49	(0.88)	207			
Program Component * Type				0.00	1, 1007	0.95
District * Traditional	1.21	(0.78)	609			
District * Reform	1.45	(0.86)	158			
SAHE Grantee * Traditional	1.38	(0.72)	195			
SAHE Grantee * Reform	1.60	(0.92)	49			

Source: Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Scale Definition: ICPT=(A4_4a + A4_4b + A4_4c + A4_4d + A4_4e + A4_4f)
Scale Reliability: .87
Variables: ICTP

EXHIBIT E.3.19

Percent of Teacher Participations in District Eisenhower-assisted Activities Compared to All Teachers in the Nation, Overall and by District Poverty (n=1197)

District Poverty	Percent of all teachers from high-poverty schools	Percent of Title II participations from high-poverty schools
Overall	21	23
Low	4	2
Medium	14	17
High	45	51

Source: Results for all teachers are based on data on the full population of schools from the CCD. Data on Title II participations are based on the Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998, including both respondents and non-respondents.
Variables:

EXHIBIT E.3.20

Percent of Teacher Participations in District and SAHE Grantee Eisenhower-assisted Activities from High-poverty Schools (District n=1197, SAHE Grantee n=254)

	Percent of Teachers from High Poverty Schools
All Teachers	21
District Participations	23
SAHE-grantee Participations	13

Source: Results for all teachers are based on data on the full population of schools from the CCD. Data on Title II participations are based on the Mail Survey of Teachers Participating in Eisenhower-assisted Professional Development Activities, 1998, including both respondents and non-respondents.
Note: "Districts" refers to teachers who participated in Eisenhower-assisted activities provided through the district component of the program. "SAHE Grantees" refers to teachers who participated in Eisenhower-assisted activities supported through the SAHE component of the program.
Variables:

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EXHIBIT E.3.21a

The Relationships of Features of Professional Development to Teacher Outcomes

Predictors	Dependent Variables^a							
	Span	Amount	Collective Participation	Content Focus	Active Learning	Coherence	Knowledge and Skills	Improved Practice
Sponsor (1=District, 2=SAHE grantee)	.27*** 1.25 (.15)	.27*** 26.27 (3.27)	-.13*** -.36 (.10)	.15*** .40 (.09)	.08** .15 (.05)	.01 .02 (.06)	.02 .04 (.06)	-.01 -.02 (.06)
Type (1=Traditional, 2=Reform)	.21*** .88 (.14)	.10** 9.29 (2.98)	.04 .11 (.09)	.01 .02 (.08)	.02 .03 (.05)	.02 .03 (.06)	.05* .11 (.05)	.04 .08 (.05)
Time Span (1=<a day ... 9=over a year)				.08* .05 (.02)	.30*** .12 (.01)	.26*** .11 (.01)	.02 .01 (.01)	.02 .01 (.01)
Contact Hours				.10** .00 (.00)	.31*** .01 (.00)	.16*** .00 (.00)	.03 .00 (.00)	.09** .00 (.00)
Collective Participation				.06 .05 (.02)	.13*** .08 (.02)	.08** .06 (.02)	.03 .02 (.02)	.02 .00 (.00)
Content Focus							.33*** .29 (.02)	-.11*** -.08 (.02)
Active Learning							.14*** .18 (.04)	.03 .04 (.04)
Coherence							.42*** .51 (.03)	0.21*** 0.22 0.04
Enhanced Knowledge & Skills (EKS)								.44*** .39 (.03)
R^2 (in percentage)	12.3	10.5	6.1	11.3	34.9	19.6	51.7	41.6

Note: ^{a} For each dependent variable, standardized regression coefficient (β) is shown on the first line; unstandardized regression coefficient (b) on the second line; standard error (in parentheses) on the third line.
* $p<.05$; ** $p<.01$; *** $p<.001$

EXHIBIT E.3.21a (Continued)

The Relationships of Features of Professional Development to Teacher Outcomes

	Dependent Variables [a]									
Predictors	**Sponsor**	**Type**	**Span**	**Contact Hours**	**Collective Participation**	**Content Focus**	**Active Learning**	**Coherence**	**Knowledge and Skills**	**Improved Practice**
School, percent of students in poverty	-.08* .00 (.00)	.06 .00 (.00)	-.02 .00 (.00)	-.07 -.11 (.06)	.04 .00 (.00)	.03 .00 (.00)	-.02 .00 (.00)	.03 .00 (.00)	.02 .00 (.00)	.02 .00 (.00)
School, percent of minority students	.00 .00 (.00)	.03 .00 (.00)	.06 .00 (.00)	.16*** .20 (.05)	.04 .00 (.00)	.07 .00 (.00)	.04 .00 (.00)	.02 .00 (.00)	.02 .00 (.00)	-.04 .00 (.00)
Teacher's Gender (1=Female, 2=Male)	.02 .02 (.04)	.04 -.04 (.04)	.02 .07 (.16)	.02 2.54 (3.52)	-.02 -.05 (.10)	.05 .13 (.09)	-.01 -.02 (.06)	-.07* -.14 (.07)	-.03 -.07 (.06)	-.01 -.03 (.06)
Subject (1=Math, 2=Science)	-.06 -.04 (.03)	-.02 -.02 (.03)	.00 .00 (.12)	.07* 5.50 (2.50)	.03 .07 (.07)	.11*** .22 (.07)	.05 .07 (.04)	-.03 -.05 (.05)	.02 .04 (.04)	.04 .06 (.04)
Grade Level (1=Elem, 2=Mid, 3=High)	.13*** .06 (.02)	-.01 .00 (.02)	-.13*** -.28 (.08)	-.07 -3.17 (1.64)	-.13 -.17 (.05)	-.18*** -.23 (.04)	-.12*** -.10 (.03)	-.15*** -.13 (.03)	.04 .04 (.03)	-.12 -.11 (.03)
In-field Certification (0=No, 1=Yes)	-.14*** -.11 (.03)	-.03 -.03 (.03)	.04 .17 (.12)	.00 -.28 (2.69)	.01 .03 (.08)	.04 .09 (.07)	.04 .06 (.04)	.10** .16 (.05)	.01 .03 (.05)	-.07** -.12 (.05)
Teaching Experience (in years)	-.03 .00 (.00)	-.01 .00 (.00)	.03 .01 (.01)	-.03 -.13 (.14)	.10** .01 (.00)	.00 .00 (.00)	-.08 .00 (.00)	.02 .00 (.00)	-.03 .00 (.00)	.05* .00 (.00)

Note: [a] For each dependent variable, standardized regression coefficient (β) is shown on the first line; unstandardized regression coefficient (b) on the second line; standard error (in parentheses) on the third line.
* $p<.05$; ** $p<.01$; *** $p<.001$

EXHIBIT E.3.21b

VARIABLE DEFINITIONS

Variables	Symbol	Coding
School, percent of students in poverty	SCI-FLPC (source: CCD)	Percent (0 to 100)
School, percent of minority students	SC_MINPC (source: CCD)	Percent (0 to 100)
Teacher's Gender	A5_1	1=Female, 2=Male
Subject	SUBJECT (source: survey database)	1=Math, 2=Science
Grade Level	LEVTYPE (source: survey database)	1=Elementary, 2=Middle, 3=High

In-field Certification	INFIELD	0=No, 1=Yes
		Defined as follows:
		If (LEVTYPE=1 and (CERT_ELE=1 or CERTIF_M=1 or CERTIF_S=1)) or
		(LEVTYPE=2 and (CERT_MID=1 or CERTIF_M=1 or CERTIF_S=1)) or
		(LEVTYPE=3 and (CERT_SEC=1 or CERTIF_M=1 or CERTIF_S=1))
		then INFIELD=1; Else INFIELD=0;
		where the following are based on item A5-5:
		CERT_ELE is certification in elementary education
		CERTIF_M is certification in math or math education
		CERTIF_S is certification in science or science education

Teaching Experience in mathematics or science	TCHEXP	Years Defined as follows: If SUBJECT=1 and A5_3b ne . then TCHEXP=A5_3b; Else if SUBJECT=2 and A5_3c ne . then TCHEXP=A5_3c; Else TCHEXP=A5_3a;
Sponsor	STYPE (source: survey database)	1=District, 2=SAHE grantee
Type	ATYPE	Activity Type(1=Traditional, 2=Reform) Defined as follows: If a3_2a=1 or a3_2b=1=b or a3_2c=1 or a3_2e=1 then ATYPE=1 Else ATYPE=2

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EXHIBIT E.3.21b (Continued)

Variable Definitions

Variables	Symbol	Coding
Time Span	Time Span	1=<a day, 2=a day, 3=2-4 days, 4=a week, 5=a month, 6=2-5 months, 7=6-9 months, 8=10-12 months, 9=over a year Derived from combination of A3_7cat and A3_8
Contact Hours	A3_10_12	Hours Defined as A3_10 + A3_12
Collective Participation	SCH_BASE	0 to 2 Defined as A3_24c + A3_24d Scale Reliability = .35
Content Focus	D2_CO=1	If A3_15f=2 then D2_CO=1; else D2_CO=O
Active Learning	ALEARN_T	ALEARN_T=(A3_6a +A3_6c + A3_6f + A3_6h + A3_6i) + 5/4*(A3_6b + A3_6d +A3_6e + A3_35D) + (A3_27e+A3_27f+A3_27g+A3_27h+A3_27j) + 5/4*(A3_27m+A3_27n+A3_6g+A3_35e) Scale Reliability =.84
Coherence	COHERE_T	COHERE_T=1.5*(A3_34e + A3_34f)+(A3_34a + A3_34c + A3_34d)+(A3_31 + A3_32, +A3_33) Scale Reliability =.71
Enhanced Knowledge & Skills	EKS_I	EKS_I=(A4_1a + A4_1b + A4_1c + A4_1d + A4_1e + A4_1f)/6 Scale Reliability =.78
Change in Teaching Practice	ICTP	ICPT=(A4_4a + A4_4b + A4_4c + A4_4d + A4_4e + A4_4f)/6 Scale Reliability =.87

EXHIBIT E.3.21c

Correlations among Teacher Activity Variables

	Poverty	Minority	Gender	Subject	Grade	In-Field	Teaching Experience	Sponsor	Type	Span
School, percent of students in poverty	1.00									
School, percent of minority students	.50***	1.00								
Teacher's Gender	.00	-.03	1.00							
Subject	.02	.06	.13***	1.00						
Grade Level	-.15***	.01	.33***	.02	1.00					
In-field Certification	-.10*	-.08*	-.07*	-.02	-.02	1.00				
Teaching Experience	-.03	-.08*	.05	-.04	-.02	.02	1.00			
Sponsor	-.08	-.03	.03	-.07	.12***	-.11***	-.12***	1.00		
Type	.06	.07*	-.03	-.04	-.05	-.03	-.04	.03	1.00	
Time Span	.01	.04	-.01	-.02	-.06	-.04	-.04	.30***	.19**	1.00
Contact Hours	.01	.12***	.02	.05	-.01	-.06*	-.08*	.29***	.10**	.41***
Collective Participation	.08*	.05	-.09**	.02	-.14***	.03	.10**	-.15***	.02	-.01
Content Focus	.08*	.09**	-.03	.12	-.19***	.01	-.04	.17***	.05	.18***
Active Learning	.03	.08*	-.09**	.02	-.15***	.03	-.10**	.26***	.09**	.45***
Coherence	.03	.05	-.20***	-.09	-.21***	.11***	-.02	.11***	.10**	.32***
Enhanced Knowledge & Skills	.08*	.11*	-.08*	.04	-.15***	.05	-.08**	.19***	.16***	.34***
Change in Teaching Practice	.05	.03	-.15	.00	-.25***	.01	.01	.10**	.13***	.26***

* *p*<.05; ** *p*<.01; *** *p*<.001
Note: Pairwise correlations are based on n's ranging from 901 to 1027.

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EXHIBIT E.3.21c (Continued)

Correlations among Teacher Activity Variables

	Contact Hours	Collective Participation	Content Focus	Active Learning	Coherence	Knowledge and Skills	Improved Practice
School, percent of students in poverty							
School, percent of minority students							
Teacher's Gender							
Subject							
Grade Level							
In-field Certification							
Teaching Experience							
Sponsor							
Type							
Time Span							
Contact Hours	1.00						
Collective Participation	.01	1.00					
Content Focus	.18***	.06	1.00				
Active Learning	.46***	.14***	.26***	1.00			
Coherence	.23***	.12***	.29***	.49***	1.00		
Enhanced Knowledge & Skills	.30***	.11***	.51***	.48***	.62***	1.00	
Change in Teaching Practice	.26***	.13***	.25***	.40***	.54***	.58***	1.00

Note: * p<.05; ** p<.01; *** p<.001

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EXHIBIT E.3.21d

Items from Teacher Activity Survey Used in Analyses Reported in Chapter 3

SECTION III: DESCRIPTION OF ONE PROFESSIONAL DEVELOPMENT ACTIVITY

The following questions ask you to describe the professional development activity identified on the label on the cover of the survey, which you participated in over the past year.

In answering questions about the identified activity, *please include all components of the activity*, even if they occurred at different times during the year. (For example, if the activity was a summer institute with follow-up during the school year, include both the summer institute and the follow-up in your answers.)

2. Which of the following best describes the activity? **Choose only one response**. If more than one response fits the activity, pick the response that best describes the aspect of the activity in which you spent the most time.

Participation in an in-district workshop or institute	a
Attendance at a college course	b
Attendance at an out-of-district workshop or institute	c
Participation in a teacher collaborative or network	d
Attendance at an out-of-district conference	e
Working in an internship or immersion activity	f
Working with a mentor, coach, lead teacher, or observer	g
Use of a teacher resource center	h
Participation in a teacher committee or task force	i
Participation in a teacher study group	j
Other (please specify) ______________________	k

5. As part of the professional development activity, including any preliminary and follow-up sessions, did you have the opportunity to try out what you learned in your classroom and obtain feedback or guidance?

Yes	1
No	2 (skip to question 7)

EXHIBIT E.3.21d (Continued)

Items from Teacher Activity Survey Used in Analyses Reported in Chapter 3

6. How did this professional development activity help you use new skills in your classroom? (Circle all that apply.)

Practiced under simulated conditions, with feedback	a
Received coaching or mentoring in the classroom	b
Met formally with other activity participants to discuss classroom implementation	c
My teaching was observed by the activity leader(s) and feedback was provided	d
My teaching was observed by other participants and feedback was provided	e
Communicated with the leader(s) of the activity concerning classroom implementation	f
My students' work was reviewed by participants or the activity leader	g
Met informally with other participants to discuss classroom implementation	h
Developed curricula or lesson plans, which other participants or the activity leader reviewed	i
Other (specify) ____________________	j

7. Over what period of time was the activity spread, including the main activity and any formal preliminary or follow-up sessions? (Circle one response.)

Less than one day	a
One day	b
Two-four days	c
A week	d
A month	e
More than a month	f

8. In what month or months did the activity (including any preliminary or formal follow-up sessions) take place? Check the appropriate month(s) on the timeline below.

Before June 1997	June 1997	July 1997	Aug 1997	Sept 1997	Oct 1997	Nov 1997	Dec 1997	Jan 1998	Feb 1998	Mar 1998	April 1998	May 1998	June 1998

10. Between June 1997 and the present, including the main activity and any preliminary activities or formal follow-up sessions, how many hours were you engaged in this activity overall?

________hours

EXHIBIT E.3.21d (Continued)

Items from Teacher Activity Survey Used in Analyses Reported in Chapter 3

11. Is the activity still continuing?

Yes.. 1
No .... 2 (skip to question 15)

12. How many hours do you expect to be engaged in this activity between now and the end of the school year?

________hours

15. How much emphasis did the activity give to each of the following areas?

		No Emphasis	Minor Emphasis	Major Emphasis
a.	Curriculum (e.g., units, texts, standards)	0	1	2
b.	Instructional methods	0	1	2
c.	Approaches to assessment	0	1	2
d.	Use of technology in instruction (e.g., computers, graphing calculators)	0	1	2
e.	Strategies for teaching diverse student populations (e.g., students with disabilities, from underrepresented populations, economically disadvantaged, range of abilities)	0	1	2
f.	Deepening your knowledge of mathematics	0	1	2
g.	Leadership development	0	1	2
h.	Other: (please specify)____________________	0	1	2

24. Which of the following characterize the participants in this activity? (Circle all that apply.)

Teachers as individuals	a
Teachers as representatives of their departments, grade level, or school	b
All teachers in department or grade-level groupings	c
All teachers in a school or set of schools	d
Other configurations (specify) ______________________	e

EXHIBIT E.3.21d (Continued)

Items from Teacher Activity Survey Used in Analyses Reported in Chapter 3

27. Which of the following did you engage in during the activity? (Circle all that apply.)

Listened to a lecture	a
Observed a demonstration of a lesson or unit	b
Participated in a whole-group discussion	c
Participated in a small-group discussion	d
Gave a lecture or presentation	e
Conducted a demonstration of a lesson, unit, or skill	f
Led a whole-group discussion	g
Led a small-group discussion	h
Engaged in extended problem solving	i
Wrote a paper, report or plan	j
Practiced using student materials	k
Developed or reviewed materials	l
Reviewed student work	m
Scored assessments	n
Collaborated as a colleague with mathematicians	o
Used technology (computers, calculators, or the internet)	p
Completed paper-and-pencil problems or exercises	q
Assessed participants' knowledge or skills	r
Other: (please specify)____________	s

31. Have you discussed what you learned with other teachers in your school or department *who did not attend* the activity?

Yes	1
No	2

32. Have you discussed or shared what you learned with *administrators* (e.g., principal or department chair)?

Yes	1
No	2

33. Outside of formal meetings held as part of the activity, have you communicated with participants in the activity who teach in other schools?

Yes	1
No	2

EXHIBIT E.3.21d (Continued)

Items from Teacher Activity Survey Used in Analyses Reported in Chapter 3

34. To what extent was the professional development activity:

	Not at all				Great Extent	Not Applicable
a. Consistent with your own goals for your professional development	1	2	3	4	5	na
b. Consistent with your school's or department's plan to change practice	1	2	3	4	5	na
c. Based explicitly on what you had learned in earlier professional development experiences	1	2	3	4	5	na
d. Followed up with activities that built upon what you learned in this professional development activity	1	2	3	4	5	na
e. Designed to support state or district standards/curriculum frameworks	1	2	3	4	5	na
f. Designed to support state or district assessment	1	2	3	4	5	na

35. How was the activity evaluated (if evaluated)? (Circle all that apply.)

Participants completed a survey	a
Participants were interviewed to provide feedback	b
The session was observed by an evaluator	c
My classroom was observed	d
Student outcomes in my classroom were evaluated	e
Some other form of evaluation took place (specify)________________	f
No discernible evaluation took place	g

EXHIBIT E.3.21d (Continued)

Items from Teacher Activity Survey Used in Analyses Reported in Chapter 3

SECTION IV: EFFECTIVENESS OF THE MATHEMATICS RELATED PROFESSIONAL DEVELOPMENT ACTIVITY

The following questions ask about the effectiveness of the same professional development activity you described in Section III.

1. To what extent do you feel that your knowledge and skills have been enhanced in each of the following areas as a result of your participation in the identified professional development activity? (Circle one response on each line.)

	Not at All				Great Extent
a. Curriculum (e.g., units, texts, standards)	1	2	3	4	5
b. Instructional methods	1	2	3	4	5
c. Approaches to assessment	1	2	3	4	5
d. Use of technology in instruction (e.g., computers, graphing calculators)	1	2	3	4	5
e. Strategies for teaching diverse student populations (e.g., students with disabilities, from underrepresented populations, economically disadvantaged, range of abilities)	1	2	3	4	5
f. Deepening knowledge of mathematics	1	2	3	4	5
g. Leadership development	1	2	3	4	5
h. Adapting teaching to meet state assessment requirements	1	2	3	4	5
i. Adapting teaching to meet state standards or curriculum framework requirements	1	2	3	4	5
j. Learning about state assessments in professional development	1	2	3	4	5
k. Learning about state standards or curriculum frameworks in professional development	1	2	3	4	5
l. Other: (please specify)____________	1	2	3	4	5

2. Have you attempted to introduce changes in your teaching because of your participation in the identified activity?

Yes 1
No .... 2 (skip to section V)

EXHIBIT E.3.21d (Continued)

Items from Teacher Activity Survey Used in Analyses Reported in Chapter 3

4. To what extent have you made each of the following changes in your teaching practices as a result of the professional development activity (Circle one number for each line):

	No Change	Minor Change	Moderate Change	Significant Change
a. The mathematics curriculum content	0	1	2	3
b. The cognitive challenge of math classroom activities	0	1	2	3
c. The instructional methods I employ	0	1	2	3
d. The types or mix of assessments I use to evaluate students	0	1	2	3
e. The ways I use technology in instruction (calculator or computer)	0	1	2	3
f. The approaches I take to student diversity	0	1	2	3

SECTION V: TEACHER BACKGROUND AND WORKLOAD

1. Please indicate your sex. (Circle one response.)

Female	1
Male	2

2. Please indicate your ethnicity/race. (Circle one response.)

American Indian or Alaskan Native	1
Asian or Pacific Islander	2
African American, not of Hispanic origin	3
White, not of Hispanic origin	4
Hispanic	5
Other: (please specify) ______	6

3. How many years of teaching experience do you have?

a. Overall __________ years
b. Teaching math __________ years
c. Teaching science __________ years

EXHIBIT E.3.21d (Continued)

Items from Teacher Activity Survey Used in Analyses Reported in Chapter 3

4. Please mark the box[es] next to the degree(s) you hold. Use the list of code numbers from the next page to indicate your major and minor fields of study for each degree. (If you do not have a second major or minor field, please enter "00".)

Post-secondary degrees	(Circle one on each line)		Enter field code from list on next page (Question 5)		Enter year of degree
	Yes	No	Major Field	Second Major/Minor	
a. Bachelor's Degree	1	2			
b. 2nd Bachelor's Degree	1	2			
c. Master's Degree	1	2			
d. 2nd Master's Degree	1	2			
e. Doctorate (e.g., Ph.D., Ed.D.)	1	2			
f. Professional Degree (e.g., M.D., L.L.B., J.D., D.D.S.)	1	2			

5. Certification: Circle the field codes of the subjects listed below for which you have state certification.

List of Teaching Field and College Major Codes:

Education	
Elementary education	01
Middle school education	02
Secondary education	03
Mathematics education	04
Science education	05
Special education	06
Bilingual education	07
Other general education	08

Math/Computer Science	
Mathematics	21
Computer science	22

Science	
Biology/life science	11
Geology/earth sciences	12
Chemistry	13
Physics	14
Engineering	15
Other natural sciences	16

Other	
English/language arts	31
Social sciences/social studies	32
Vocational education/agriculture	33
Arts/music	34
Foreign languages	35
Philosophy	36
Psychology	37
Health/PE	38
Other: (please specify)________	40
Administration	50

APPENDIX F

SUPPLEMENT FOR CHAPTER 4

This appendix provides supplementary information for the analyses reported in Chapter 4. Each Exhibit in the appendix corresponds to an Exhibit of the same number in Chapter 4. The boxes at the bottom of each Exhibit refer to District Eisenhower Coordinator Telephone Survey item numbers or composite variables on which the exhibit is based. District Coordinator Survey item numbers begin with the letter "D," followed by the section of the survey (part A or B) and the item involved. For example, item numbers "DA044_1, DA044_2, and DA044_3" refer to the District Coordinator Survey part A, item 44_1, 2, and 3. (Item 44_1 is shown on printed copies of the survey as 44a, 44_2 is shown as 44b, etc.) All items referred to in the chapter appear at the end of Appendix G, in Exhibit 5.11d. Composite variables, which appear in all capital letters (for example, PCTIDW), are defined in Exhibit 5.11b.

EXHIBIT F.4.1

Percent of Teachers in Districts Using Eisenhower Funds to Support Professional Development Activities, by Subject Area (n=353)

Subject Areas	Percent
Math	98.74
Science	98.67
Language Arts	43.87
Social Studies	26.41
Technology	24.23
Art or Music	5.24
Health or PE	1.86
Special Education	4.28
Other subjects	11.75

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998, reporting on the 1997-1998 school year.
Variables: DA044_1-3

EXHIBIT F.4.2

Percent of Participations in Eisenhower-assisted Professional Development Activities, by Subject Area (n=312)

Subject Areas	Percent of Participations
Math	43.99
Science	30.22
Technology	3.56
Combination of math, science, & technology	11.43
Other subjects	10.78

Source: District coordinator lists of Eisenhower-assisted activities provided in the district from July 1 through December 31, 1997.
Variables: PCTACT

EXHIBIT F.4.3

Percent of Participations in Traditional Types of Eisenhower-assisted Activities (n=353)

Traditional Types of Professional Development	Percent of Participations
In-district workshops and institutes	55.88
Out-of-district workshops and conferences	20.64

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: PCTIDW, PCTODW

EXHIBIT F.4.4a

Percent of Eisenhower-assisted In-district Workshops and Institutes, by Contact Hours (n=314[1])

&

EXHIBIT F.4.4b

Percent of Eisenhower-assisted In-district Workshops and Institutes, by Time Span (n=314)

Duration	Percent
Total Contact Hours	
Less than 4 hours	17.95
4-8 hours	34.74
9-40 hours	38.31
More than 40 hours	8.98
Span Over Time	
One day	31.74
2-7 days	36.59
8 days to one month	8.08
One month to one year	16.25
More than one year	7.32

***Source*:** Telephone Survey of District Eisenhower Coordinators, Spring 1998.
***Variables*:** DA083_1-4, DA084_1-5

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[1] Of our total sample of 363 district Eisenhower coordinators, 314 provided Eisenhower-assisted in-district workshops and institutes; therefore all analyses that pertain to in-district workshops and institutes have a sample of 314.

EXHIBIT F.4.5a

Percent of Teachers in Districts in which Eisenhower-assisted In-district Workshops and Institutes Include Collective Participation (n=314)

Collective Participation	Percent
All Teachers in Department or Grade	74.35
All Teachers in School	58.19

***Source*:** Telephone Survey of District Eisenhower Coordinators, Spring 1998.
***Variables*:** DA078_3, DA078_4 if DA072=1

EXHIBIT F.4.5b

Collective Participation in Eisenhower-assisted In-district Workshops and Institutes, Overall and by District Poverty and District Size (n=314)

	Mean	*SD*	*n*	*F*	*df*	*p*	***Significant Tukey Pairwise Contrasts (where $p \le .05$)***			
Overall	.66	.38	314							
Poverty Level				.77	2, 302	.46	Low	Medium	High	
Low	.64	(.37)	97							
Medium	.65	(.37)	119							
High	.70	(.39)	98							
District Size				6.52	3, 302	.00	Small	Medium	Large	Consortium
Small	.55	(.36)	68						x	
Medium	.62	(.37)	116				x		x	
Large	.77	(.37)	96							
Consortium	.71	(.39)	34							
Poverty*Size				1.82	6, 302	.09				

***Source*:** Telephone Survey of District Eisenhower Coordinators, Spring 1998.
***Variables*:** sch-base

EXHIBIT F.4.6

Percent of Teachers in Districts that Provide Each of Five Types of Opportunities for Active Learning in Eisenhower-assisted In-district Workshops and Institutes (n=314)

Types of active learning	Percent
Observe professional development providers demonstrating or modeling skills	96.06
Observe other teachers teaching	74.22
Practice under simulated conditions with feedback	69.36
Meet in groups to discuss problems in implementation	96.80
Observed teaching in his or her own classroom	49.10

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DA081_1, DA081_2, DA081_3, DA081_4, DA081_5 where DA071=1 and DA072=1

EXHIBIT F.4.7

Number of Types of Opportunities for Active Learning in Eisenhower-assisted In-District Workshops and Institutes, Overall and by District Poverty and District Size (n=314)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where p ≤ .05)*			
Overall	3.83	(1.10)	314							
Poverty Level				1.03	2, 302	0.35	Low	Medium	High	
Low	3.70	(0.99)	108							
Medium	3.81	(1.13)	118							
High	4.07	(1.11)	88							
District Size				11.10	3, 302	0.00	Small	Medium	Large	Consortium
Small	3.29	(1.15)	68							
Medium	3.76	(0.98)	116				x			
Large	4.29	(0.94)	96				x	x		
Consortium	3.94	(1.16)	34				x			
Poverty*Size				.37	6, 302	0.90				

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: STCHIDW

EXHIBIT F.4.8a

Percent of Teachers in Districts That Support Reform Types of Professional Development Activities with Eisenhower Funds (n=353)

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EXHIBIT F.4.8b

Percent of Participations in Reform Types of Eisenhower-assisted Professional Development Activities (n=353)

Types of reform activities	Percent of teachers in districts that use Eisenhower funds to support reform types of professional development activities	Percent of participations in reform types of Eisenhower-assisted activities
Study Group	20.55	5.43
Teacher Network	37.49	4.49
Mentoring	30.22	2.51
Committee or Task Force	35.42	3.48
Internship	3.57	.18
Individual Research Project	6.54	.24

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: 8a. HASSTD, HASNET, HASMNT, HASCOM, HASRCT, HASCRS, HASINT, HASRES where NUMTYPER ne 0; 8b. PCTSTD, PCTNET, PCTMNT, PCTCOM, PCTRCT, PCTCRS, PCTINT, PCTRES

EXHIBIT F.4.9a

Percent of Participations in Reform Types of Eisenhower-assisted Professional Development Activities, Overall and by District Poverty and District Size (n=353)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where $p \leq .05$)*			
Overall	16.33	(6.71)	353							
Poverty Level				5.57	2, 341	0.00	Low	Medium	High	
Low	13.96	(19.94)	119							
Medium	19.78	(22.35)	128							
High	14.95	(20.88)	106							
District Size				1.24	3, 341	0.29	Small	Medium	Large	Consortium
Small	13.31	(23.86)	90							
Medium	16.33	(19.61)	128							
Large	19.34	(21.83)	98							
Consortium	14.83	(17.41)	37							
Poverty*Size				2.23	6, 341	0.04				

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: new3

EXHIBIT F.4.9b

Percent of Teacher Participations in Reform Types of Professional Development Activities, Interaction of District Poverty and District Size (n=353)

	High Poverty		**Medium Poverty**		**Low Poverty**	
District Size	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Small	6.18	(14.95)	19.40	(26.76)	11.85	(24.48)
Medium	13.54	(17.55)	15.55	(19.73)	18.82	(20.81)
Large	20.94	(24.71)	24.34	(22.35)	8.84	(8.43)
Consortium	6.47	(12.79)	22.88	(19.42)	9.39	(10.84)

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.

EXHIBIT F.4.10

Number of Types of Eisenhower-assisted Activities, Overall and by District Poverty and District Size (n=353)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where $p \leq .05$)*			
Overall	3.41	(1.67)	353							
Poverty Level				4.37	2, 341	0.00	Low	Medium	High	
Low	3.02	(1.55)	119							
Medium	3.63	(1.58)	128				X			
High	3.69	(1.85)	106				X			
District Size				26.23	3, 341	0.00	Small	Medium	Large	Consortium
Small	2.42	(1.31)	90							
Medium	3.23	(1.29)	128				X			
Large	4.39	(1.80)	98				X	X		
Consortium	3.85	(1.80)	37				X			
Poverty*Size				.87	6, 341	.51				

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: NUMTYPEF

EXHIBIT F.4.11a

Percent of Teachers in Districts by Span of Eisenhower-assisted Reform Activities (n varies by type)

Types of reform activities	Percent of teachers in districts with typical activities lasting less than one month	Percent of teachers in districts with typical activities lasting from one month to one year	Percent of teachers in districts with typical activities lasting more than a year
Study groups	44.48	39.49	16.02
Teacher Networks	25.09	46.25	28.66
Mentoring	24.95	53.84	21.21
Committee or task force	42.91	44.67	12.41
Internships	55.55	44.44	0.0
Individual research	25.00	58.33	16.67

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DURINTN, DURMNTN, DURCOMN, DURSTDN, DURRESN, DURNETN

EXHIBIT F.4.11b

Average Span of Eisenhower-assisted Activities, Overall and by District Poverty and District Size (n=353)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where $p \le .05$)*			
Overall	1.39	(.47)	353							
Poverty Level				1.63	2, 341	0.20	Low	Medium	High	
Low	1.36	(.47)	119							
Medium	1.42	(.48)	128							
High	1.40	(.46)	106							
District Size				3.43	3, 341	0.02	Small	Medium	Large	Consortium
Small	1.28	(.43)	90							
Medium	1.39	(.49)	128							
Large	1.50	(.45)	98				X			
Consortium	1.40	(.49)	37							
Poverty*Size				1.20	6, 341	.30				

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DURATION

EXHIBIT F.4.12

Percent of Teachers in Districts That Fund Workshops with Eisenhower Funds, Other Sources, or Not At All (n=353)

Types of traditional activities	**Percent of teachers in districts that fund workshops with Eisenhower funds**	**Percent of teachers in districts that fund workshops without Eisenhower funds**	**Percent of teachers in districts that do not offer workshops at all**
In-district workshops	89.18	3.43	7.33
Out-of-district workshops	81.73	7.47	10.80

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DA071, DA072 DA085, DA086

EXHIBIT F.4.13

Percent of Teachers in Districts That Fund Reform Activities with Eisenhower Funds, Other Sources, or Not at All (n=353)

Types of reform activities	Percent of teachers in districts that offer activity and support it with Eisenhower funds	Percent of teachers in districts that offer activity and support it without Eisenhower funds	Percent of teachers in districts that do not offer activity at all
Study groups	20.55	27.86	51.59
Teacher networks	37.49	23.96	38.54
Mentoring	30.22	31.49	38.29
Committee or task force	35.42	35.37	29.21
Internships	3.57	16.71	79.71
Individual research	6.54	18.92	74.54

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DA099, DA100, DA107, DA108, DA114, DA115, DA127, DA128, DA135, DA136, DA142, DA143

EXHIBIT F.4.14

Percent of Teachers in Districts that Report Placing No, Some, or a Strong Emphasis on Recruiting Teachers of Special Student Populations (n=363)

Special populations of teachers	No emphasis	Some emphasis	Strong emphasis
Teachers in Title I schools	41.58	28.21	30.21
Special education teachers	40.69	38.64	20.67
Limited English	53.49	26.87	19.63
Low achievement schools	33.36	23.16	43.48
High poverty schools	42.38	17.95	39.66

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DB068, DB069, DB070, DB071, DB072

EXHIBIT F.4.15

Correlation of the Emphasis on Recruitment of Teachers of Special Populations of Students (n=363)

Special populations of teachers	Teachers in Title I schools	Special Education	Limited English Proficient	Low Achievement
Special education teachers	.65***			
Limited English	.55***	.62***		
Low achievement schools	.63***	.59***	.53***	
High poverty schools	.68***	.55***	.59***	.76***

***p<.001

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DB068, DB069, DB070, DB071, DB072

EXHIBIT F.4.16

Extent of Recruitment of Teachers of Special Populations of Students, Overall and by District Poverty and District Size (n=363)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where p ≤ .05)*			
Overall	1.88	(22.03)	363							
Poverty Level				14.56	2, 351	0.00	Low	Medium	High	
Low	1.70	(.61)	124							
Medium	1.83	(.66)	131							
High	2.18	(.72)	108				x	x		
District Size				6.75	3, 351	0.00	Small	Medium	Large	Consortium
Small	1.64	(.64)	98							
Medium	1.85	(.69)	130							
Large	2.15	(.66)	98				x	x		
Consortium	1.84	(.74)	37							
Poverty*Size				.87	6, 351	.51				

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: Special

EXHIBIT F.4.17

Percent of Participations in District Eisenhower-assisted Activities by How Teachers Come to Participate (n=358[2])

Methods of Participation	Percent of Participations
Volunteer	67.68
Principal Selected	24.21
Provider Selected	2.28
Rotation	4.96
Other Ways	3.72

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DA063_1, DA063_2, DA063_3, DA063_4, DA063_5

EXHIBIT F.4.18

Percent of Teachers in Districts That Use Various Strategies to Increase the Participation of Teachers in Eisenhower-assisted Activities (n=363)

Strategies to Increase Participation	Percent
Publicize	95.79
Tailor the focus towards the needs of special populations	79.72
Use incentives	71.90
Other strategies	22.92
No special strategies are used	0.80

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998
Variables: DB075_1, DB075_2, DB075_3, DB075_4, DB075_5

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[2] Of our total sample of 363 district Eisenhower coordinators, five did not answer this survey question; therefore the sample size for this variable was 358.

APPENDIX G

SUPPLEMENT FOR CHAPTER 5

This appendix provides supplementary information for the analyses reported in Chapter 5. Each Exhibit in the appendix corresponds to an Exhibit of the same number in Chapter 5. The boxes at the bottom of each Exhibit refer to District Eisenhower Coordinator Telephone Survey item numbers or composite variables on which the exhibit is based. District Coordinator Survey item numbers begin with the letter "D," followed by the section of the survey (part A or B) and the item involved. For example, item numbers "DA044_1, DA044_2, and DA044_3" refer to the District Coordinator Survey part A, item 44_1, 2, and 3. (Item 44_1 is shown on printed copies of the survey as 44a, 44_2 is shown as 44b, etc.) All items referred to in the chapter appear in Exhibit 5.11d. Composite variables, which appear in all capital letters (for example, PDIRT), are defined in Exhibit 5.11b.

EXHIBIT G.5.1a

Percent of Teachers in Districts in which State and District Mathematics and Science Standards and Assessments Exist (n=363)

	State Standards	State Assessments	District Standards	District Assessments
Mathematics	90.8	91.3	84.9	69.5
Science	84.6	72.3	78.5	42.0

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DA154,DA156, DA159, DA161, DA165, DA167, DA170, DA172

EXHIBIT G.5.1b

Percent of Teachers in Districts Where Eisenhower-assisted Activities Are Aligned "To a Large Extent" with State and/or District Standards and/or Assessments (Where Such Standards and Assessments Exist) (n varies)

	State Standards	State Assessments	District Standards	District Assessments
Mathematics	85.1	70.8	85.4	69.2
Science	83.4	70.4	85.7	66.8

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DA155, DA157, DA160, DA162, DA166, DA168, DA171, DA173

EXHIBIT G.5.1c

Degree of Alignment Between Eisenhower-assisted Activities and Standards and Assessments, Overall and by District Poverty and District Size (n=363)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where p ≤ .05)*			
Overall	4.0	.99	363							
Poverty Level				10	2, 351	.90	Low	Medium	High	
Low	3.92	.99	124							
Medium	3.98	.96	131							
High	4.11	1.01	108							
District Size				4.26	3, 351	.01	Small	Medium	Large	Consortium
Small	3.74	1.10	98							
Medium	4.03	.91	130							
Large	4.25	.87	98				X			
Consortium	3.90	1.10	37							
Poverty*Size				.79	6, 351	.58				

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: pdirtx

EXHIBIT G.5.2

Percent of Teachers in Districts According to Eisenhower Coordinator's Roles within the District Office (n=363)

Position within district office	Percent of teachers in districts in which the district has the position	Percent of teachers in districts in which district Eisenhower Coordinator fills position	Percent of teachers in districts in which the person in the position participates in Eisenhower decision making
General Curriculum/Instruction Coordinator	80.2	48.0	90.5
Mathematics Coordinator	58.0	46.4	96.3
Science Coordinator	56.8	46.7	96.9
Professional Development Coordinator	69.1	38.9	80.6
Special Education Coordinator	91.5	8.4	61.9
Title I Coordinator	86.6	24.7	78.1
Federal Programs Coordinator	59.5	42.6	82.8

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DA009-DA040
Note: There may be overlap in the positions filled by Eisenhower coordinators or positions filled by other individuals. For instance, an Eisenhower coordinator may be the district's curriculum coordinator and the district's mathematics and science coordinator. Similarly, any other individual who works closely with the Eisenhower coordinator may serve in multiple roles, for instance as the Title I coordinator and the federal programs coordinator.

EXHIBIT G.5.3a

Percent of Teachers in Districts in which Eisenhower Activities Coordinate (Co-fund and/or Work Closely) with Other Programs (n varies)

Federal Program	Percent of teachers in districts where federal program operates in state/district	Percent of teachers in districts where federal program supports professional development in district	In districts where federal program operates and supports professional development, percent of teachers in districts that co-fund with other programs	Percent of teachers in districts with other federal programs in which Eisenhower coordinator works closely with other programs
SSI	44.4	66.7	65.7	59.2
USI	17.0	89.5	86.1	85.9
RSI	3.7	78.3	27.7	85.5
LSC	12.0	91.1	75.7	91.9
Title I, A	90.9	90.6	49.9	81.8
Title I, C	39.6	62.6	35.1	66.7
Title III	28.7	90.8	39.3	73.4
Title VI	77.0	72.8	47.7	77.9
Title VII	46.6	82.0	27.6	60.7
Title IX	19.1	56.9	4.9	42.3
IDEA	76.6	85.2	21.8	66.5
Goals 2000	85.8	73.5	33.9	61.0
School to Work	76.8	85.5	27.6	65.5
Perkins	73.8	83.5	18.7	62.2

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DB005-DB060
Note: Results on co-funding for each listed program are based on districts that participate in the program and in which the program supports professional development. Results for working closely with each program are based on districts that participate in the program.

EXHIBIT G.5.3b

Extent of Co-Funding of Eisenhower-assisted Activities with Those of Other Federal Programs, Overall and by District Poverty and District Size (n=363)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where p < .05)*
Overall	2.06	(2.07)	363				
Poverty Level				15.42	2, 351	0.00	Low Medium High
Low	1.19	(1.52)	124				
Medium	1.95	(1.94)	131				*Significant interaction effects*
High	3.00	(2.28)	108				
District Size				11.79	3, 351	0.00	Small Medium Large Consortium
Small	1.10	(1.32)	98				
Medium	1.81	(1.75)	130				
Large	2.97	(2.35)	98				*Significant interaction effects*
Consortium	2.45	(2.55)	37				
Poverty*Size				2.20	6, 351	0.04	

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998
Variables: NPROGF

EXHIBIT G.5.3c

Extent of Co-funding of Eisenhower-assisted Activities with Those of Other Federal Programs, Interaction of District Poverty and District Size (n=363)

	High Poverty		**Medium Poverty**		**Low Poverty**	
District Size	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Small	1.70	(1.52)	1.43	(1.45)	.48	(.73)
Medium	2.41	(1.85)	1.87	(1.91)	1.40	(1.43)
Large	3.70	(2.36)	2.87	(2.26)	1.50	(1.68)
Consortium	4.06	(3.07)	1.50	(1.78)	2.40	(2.62)

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998

EXHIBIT G.5.4

Percent of Teachers in Districts According to Status of District Performance Indicators for Professional Development (n=363)

Status of district performance indicators	Percent of teachers in districts
Developed indicators	32.00
Developing indicators	36.00
Not developing indicators	32.00

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DB088 DB089

EXHIBIT G.5.5

Percent of Teachers in Districts that Use Different Methods to Assess Teachers' Professional Development Needs (n=363)

Needs assessment method	Percent
Teacher survey	79.70
Teacher meetings	69.90
Principal survey	70.60
Student performance	64.60
Informal conversation	75.70

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DB079_1, DB079_2, DB079_3, DB079_4, DB079_5

EXHIBIT G.5.6

Percent of Teachers in Districts that Use Different Methods to Evaluate Eisenhower-assisted Activities (n=363)

Evaluation techniques	Percent
Teacher participation	69.90
Teacher survey	84.60
Observe teachers	71.40
Student achievement scores	60.00

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DB084_1—4

EXHIBIT G.5.7

Percent of Teachers in Districts Whose Eisenhower Staff Provide Different Types of Guidance about Professional Development to Schools and Professional Development Providers (n=363)

Types of guidance	Percent of teachers in districts providing guidance to schools	Percent of teachers in districts providing guidance to providers
Classroom visits	64.06	53.08
Phone calls	78.86	74.72
Required reports	32.55	26.84
Required evaluations	40.64	44.11
Interpreting Title II rules	63.11	39.83
Conduct needs assessments	76.65	46.79
Develop plans	81.08	51.21
Develop activities	82.23	56.02
Develop indicators	39.66	25.64

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DB143_1 – DB143_4, DB145_1 - DB145_5, DB147_1-DB147_4, DB149_1-DB149_5

EXHIBIT G.5.8

Extent of District Continuous Improvement Efforts, Overall and by District Poverty and District Size (n=363)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Tukey Pairwise Contrasts*			
Overall	2.64	(1.08)	363							
Poverty Level				4.17	2, 351	0.01	Low	Medium	High	
Low	2.46	(1.10)	136							
Medium	2.60	(1.02)	130							
High	2.86	(1.09)	97				X			
District Size				19.36	3, 351	0.00	Small	Medium	Large	Consortium
Small	1.97	(0.99)	98							
Medium	2.68	(0.97)	130				X			
Large	3.06	(0.97)	98				X	X		
Consortium	2.96	(1.17)	37				X			
Poverty*Size				2.06	6, 351	.06				

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: CONIMP_D
Scale Reliability: .61

EXHIBIT G.5.9a

Percent of Teachers in Districts Reporting That None, Some, Most, or All Professional Development Activities Are Planned at the District, School, and Cluster Levels (n=363)

	Percentage of teachers in districts in which activities are planned at the indicated level none of the time	Percentage of teachers in districts in which activities are planned at the indicated level some of the time	Percentage of teachers in districts in which activities are planned at the indicated level most of the time	Percentage of teachers in districts in which activities are planned at the indicated level all of the time
District Level	6.6	43.1	34.0	16.2
School Level	19.2	48.1	22.7	9.7
Cluster Level	56.5	36.2	5.3	2.0

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DA050, DA060, DA057

EXHIBIT G.5.9b

Extent to Which Professional Development Activities Are Planned at the School vs. District Level, Overall and by District Poverty and District Size (n=363)

	Mean	SD	n	F	df	p	Significant Tukey Pairwise Contrasts (where $p \leq .05$)			
Overall	2.32	(0.67)	363							
Poverty Level				1.49	2, 351	0.23	Low	Medium	High	
Low	2.25	(0.65)	136							
Medium	2.39	(0.68)	130							
High	2.28	(0.70)	97							
District Size				4.71	3, 351	0.00	Small	Medium	Large	Consortium
Small	2.44	(0.76)	98							x
Medium	2.32	(0.62)	130							x
Large	2.30	(0.67)	98							
Consortium	1.99	(0.56)	37							
Poverty*Size				0.62	6, 351	0.71				

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DLEVPLAN

EXHIBIT G.5.10

Percent of Teachers in Districts with Different Types of Teacher Involvement in School- and Cluster-level Professional Development Planning (n=363)

	Percent of teachers in districts with different types of teacher involvement in school-level professional development	Percent of teachers in districts with different types of teacher involvement in cluster-level professional development
Lead teachers/department chairs	76.8	40.2
Teacher committees	61.6	29.6
Individual teachers	68.7	33.4

Source: Telephone Survey of District Eisenhower Coordinators, Spring 1998.
Variables: DA058-2.3.4 and DA061-2.3.4

EXHIBIT G.5.11a

Relationship of District Management to Design and Characteristics of Professional Development

	Dependent Variables[a]									
Control variables	Align	Coordinate	District Planning	Continuous Improvement	Teacher Planning	Reform	Time Span	Collective Participation	Active Learning	Targeting
Cluster	.02	-.03	-.21***	.15**	.08	-.08	-.01	.02	-0.1	0.02
	.04	-.14	-.35	.20	.06	-.03	-.01	.01	-0.05	0.02
	(.12)	(.22)	(.10)	(.07)	(.04)	(.03)	(.06)	(.05)	(.03)	(.06)
Consortium	.45	.33	.59	-.08	.15	.41	.54	-.37	0.53	0.21
	1.45	2.22	1.63	-.17	.18	.28	.82	-.44	0.37	0.36
	(1.23)	(2.31)	(1.03)	(.73)	(.46)	(.26)	(.54)	(.47)	(.25)	(.60)
Size	.15	.30***	.07	.22***	-.05	.06	.07	.09	.27***	.00
	.10	.40	.04	.09	-.01	.01	.02	.02	.04	.00
	(.04)	(.07)	(.03)	(.02)	(.02)	(.01)	(.02)	(.02)	(.01)	(.02)
Size by Consortium	-.51	-.34	-.53	.19	-.09	-.46	-.57	.40	-.60	-.29
	-.22	-.30	-.20	.05	-.01	-.04	-.11	.06	-.06	-.07
	(.17)	(.31)	(.14)	(.10)	(.06)	(.04)	(.07)	(.06)	(.03)	(.08)
Poverty	.05	.30***	.08	.06	-.03	-.04	-.02	-.02	.07	.23***
	.00	.06	.01	.00	.00	.00	.00	.00	.00	.01
	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)	(.00)

***Note*:** [a] For each dependent variable, standardized regression coefficient (β) is shown on the first line; unstandardized regression coefficient (b) on the second line; standard error (in parentheses) on the third line.

* p<.05; ** p<.01; *** p<.001

EXHIBIT G.5.11a (Continued)

Relationship of District Implementation to Design Characteristics of Professional Development

	Dependent Variables[a]							
Predictors	**District Planning**	**Continuous Improvement**	**Teacher Planning**	**Reform**	**Time Span**	**Collective Participation**	**Active Learning**	**Targeting**
Alignment	-.08 -.03 (.02)	.16** .03 (.02)	.16** .03 (.01)	.15* .01 (.01)	-.01 .00 (.01)	.14* .03 (.01)	.04 .00 (.01)	.17** .04 (.01)
Coordination	.07 .06 (.04)	.16*** .11 (.03)	.02 .01 (.02)	.12* .03 (.01)	.03 .01 (.02)	.05 .02 (.02)	.07 .02 (.01)	.05 .03 (.03)
District vs. School Level Planning				-.07 -.02 (.01)	.11* .06 (.03)	-.09 .04 (.02)	-.09 .02 (.01)	.08 .05 (.03)
Continuous Improvement				.06 .02 (.02)	.08 .06 (.04)	.13 .02 (.04)	.20*** .07 (.02)	.17** .14 (.04)
Teacher Participation in Planning				-.07 -.04 (.03)	.03 .04 (.06)	.08 .08 (.06)	.20*** .12 (.03)	.16*** .24 (.07)
Reform vs. Traditional					.40*** .88 (.11)			
R^2 (in percentage)	6.6	23.0	2.9	6.2	20.6	9.5	23.1	23.0

Note: [a] For each dependent variable, standardized regression coefficient (β) is shown on the first line; unstandardized regression coefficient (b) on the second line; standard error (in parentheses) on the third line.
*$p<.05$; ** $p<.01$; *** $p<.001$

EXHIBIT G.5.11b

Variable Definitions

Variables	Symbol	Coding
Cluster	CLUSTER	Based on DA056 District without clusters=0, with clusters=1
Consortium	CONSORT (source: survey database)	Regular district=0, conosrtium=1
Size	LOGTCH (source: CCD)	Base 10 log of number of teachers in district
Size by Consortium	CONLOG	Interaction of Size and Consortium Status (CONSORT*SIZE)
Poverty	POVERTY (source: CCD)	Percent of school-age children in poverty (0-100)
Alignment	PDIRT	IRT scale score, based on 8 items, DA155, DA157, DA160, DA162, DA166, DA168, DA171, DA173. Each variable indicates the extent to which professional development is designed to help teachers adapt their teacher to state and district standards and assessments in mathematics and science. Each item is coded 0 (not at all), 1 (to some extent), and 2 (to a great extent). Each Eisenhower coordinator responded to only those items that applied in the coordinator's district and state. For example, coordinators were asked about alignment with state assessments in science only for districts in states with such assessments. We estimated an IRT "partial credit model," allowing separate slopes and intercepts for each item. The estimated IRT scale score has a mean of 0 and a standard deviation of one. It was rescaled for Exhibit 5.1 to have a range from 1 to 5.
Coordination/Co-funding	NPROGF	Number of programs with which district co-funds, sum of DA007, Da011, Da015, DA019, DA023, DA027, DA031, DA035, DA039, DA043, DA047, DA051, DA055, and DA059, each coded Yes=1 and No=0.

EXHIBIT G.5.11b (Continued)

Variable Definitions

Variables	Symbol	Coding
District vs. School-level planning	DLEVPLAN	DA050, coded 0= none through 3=all activities planned at district level
Continuous improvement	CONIMP_D	Sum of five scales: NEEDSA, DSUPPRO, DSUPSCH, INDICD, EVAL_D, defined as follows: NEEDSA = sum of DB079_1 - DB079_5 DSUPPRO = sum of DB143_1–DB143_4, DB145_1–DB145_5 DSUPSCH= sum of DB147_1-DB147_4, DB149_1-DB149_5 INDICD= EVAL-D= sum of DB084_1—DB084-4 The reliability of the composite is 0.61.
Teacher participation in planning	TCHPART	Weighted sum of teacher participation at district, cluster, and school levels, in proportion to the number of activities planned at each level: DA050*DA051_1 + DA057*Da058_3 + DA060*DA061_3
Reform vs Traditional	PCTNEW2	Percent of participations in reform types of activities PCTNEW2 = PCTNET+PCTINT+PCTMNT+PCTRCT+PCTCOM+PCTSTY +PCTRES Where PCTNET = percent of participations in networks PCTINT = percent of participations in internships PCTRCT = percent of participations in resource centers PCTCOM = percent of participations in committees PCTSTD = percent of participations in study groups PCTRES = percent of participations in individual research projects The total number of participations in all types of activities is defined as (TOTPART) defined as the sum of DA076, DADA088, DA098, DA102, DA110, DA118, DA124, DA130*DA131, DA138*DA139, DA145. The percent of participations in networks (PCTNET) = DA102/Totpart, etc. The number of types of Eisenhower-assisted activities, NUMTYPER, is the sum of the number of types with one or more participants

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EXHIBIT G.5.11b (Continued)

Variable Definitions

Variables	Symbol	Coding
Time Span	DURATION	Duration of Eisenhower assisted activities, defined as the weighted average of the typical duration of each supported type, in proportion to the number of participations in each type. For each type, the typical duration is coded 1= one month or less, 2=between one month and one year, 3=more than one year. The typical duration of in-district workshops (DURIDW) was derived from DA084, which reports the percent of workshops spread over one day, 2-7 days, 8 days to one month, one month to one year, and more than one year. The typical durations of other types were derived from items such as DA106 for networks (DURNET). We did not include items on the survey concerning the typical durations for college courses and resource centers. To create the DURATION variable, we assumed that the duration of college courses s between one month and one year (DURCRS=2). We made the same assumption about the average duration of participation in resource centers. Since the overall rate of participation in these two types of activities is very low, these assumptions make little difference in the overall results. DURATION = PCTIDW*DURIDW + PCTODW*DURIDOW + PCTCRS+DURCRS + PCTNET*DURCRS + PCTINT*DURINT + PCTMNT*DURMNT + PCTRCT*DURRCT + PCTCOM*DURCOM + PCTSTD +DURSTD + PCTRES*DURRES
Collective Participation	SCHLPART	Sum of DA078_3 and DA078_4, each coded Yes=1, No=0. Defined only for districts with non-zero participations in-district workshops
Active Learning	STCHIDW	Sum of DA081_1 – DA081_5. Defined only for districts with non-zero participations in in-district workhops.
Targeting	TARGET	Average of DB068, DB069, DB070, DB071, and DB072, each coded 1=no emphasis, 1=some emphasis, 2=strong emphasis.

EXHIBIT G.5.11c

Correlations among District Professional Development Variables

	Poverty	Consortium	Size	Size by Consortium	Cluster	Alignment	Coordinate	District Planning	Continuous Improvement
Poverty	1.00								
Consortium	.06	1.00							
Size	.37***	.09*	1.00						
Size by Consortium	.09*	.99***	.12**	1.00					
Cluster	.15***	-.29***	.42***	-.29***	1.00				
Alignment	.16***	-.05	.17***	-.06	.11*	1.00			
Coordination	.44***	.04	.42***	.05	.17***	.17***	1.00		
District vs. School Level Planning	.08*	.10**	.05	.10**	-.14***	.08*	-.04	1.00	
Continuous Improvement	.20***	.08*	.30***	.02*	.22***	.23***	.24***	-.10**	1.00
Teacher Participation in Planning	.06	.01	.07	.01	.05	.05	.10**	.00	.03
Reform (vs. Traditional) Type	.14***	-.03	.24***	-.04	.10**	.20***	.23***	-.08*	.14***
Time Span	.07	.06	.16***	.04	.07*	.11**	.04	.14***	.15***
Collective Participation	-.03	.02	.02	.03	.01	.10**	.17***	-.14***	.06
Active Learning	.14***	.07	.30***	.07	.09*	.15***	.18***	-.12**	.28***
Targeting	.40***	-.05	.29***	-.04	.19***	.17***	.35***	.05	.20***

Note: * $p<.05$; ** $p<.01$; *** $p<.001$

EXHIBIT G.5.11c (Continued)

Correlations among District Professional Development Variables

	Teacher Participate	Reform	Time Span	Collective Participation	Active Learning	Targeting
Poverty						
Consortium						
Size						
Size by Consortium						
Cluster						
Alignment						
Coordination						
District vs. School Level Planning						
Continuous Improvement						
Teacher Participation in Planning	1.00					
Reform (vs. Traditional) Type	-.07*	1.00				
Time Span	-.01	.33***	1.00			
Collective Participation	.06	.09*	-.04	1.00		
Active Learning	.22***	.16***	.06	.21***	1.00	
Targeting	.25***	-.03	.09**	.04	.15***	1.00

Note: * $p<.05$; ** $p<.01$; *** $p<.001$

EXHIBIT G.5.11d

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

DISTRICT TELEPHONE INTERVIEW

NOTE: The District Telephone Interview was administered as a Computer-Assisted form, and the items as administered appeared on a computer screen. The following printed items parallel the versions that appeared on the CATI screen, but some details have been changed.

PART A

Organizational structure

5-38. I'd like to ask you first about the structure of your district office and your place in it.

	Does your district have position?	Is it funded wholly or in part by Eisenhower funds?	Do you fill the role?	Does the person in the position work with you in making decisions about the Eisenhower program?
Eisenhower coordinator	Y N	Y N	Y N	
Curriculum/instruction coordinator	Y N	Y N	Y N	Y N
Mathematics coordinator	Y N	Y N	Y N	Y N
Science coordinator	Y N	Y N	Y N	Y N
Professional development coordinator	Y N	Y N	Y N	Y N
Special education coordinator	Y N	Y N	Y N	Y N
Title I coordinator	Y N	Y N	Y N	Y N
Federal programs coordinator	Y N	Y N	Y N	Y N
Are there other district office staff who work with you in making decisions about Eisenhower? (specify)	Y N	Y N		

Professional development

44. In which of the following subject areas do you support professional development using Eisenhower funds? (check all that apply)
   a. Mathematics?
   b. Science?
   c. Any Other (specify) ________________

50. How many of your district's Eisenhower-supported activities are planned at the DISTRICT LEVEL?
   0 None
   1 Some
   2 Most
   3 All

EXHIBIT G.5.11d (Continued)

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

51. Which of the following best describes the role teachers play in making decisions about Eisenhower-supported activities planned at the district level?

a. Do teachers participate in a formal planning committee
b. Are teachers consulted informally
c. Are teachers consulted in a needs assessment or
d. Do teachers not play a regular role
e. Other (specify)

56. Does your district have sub-districts, clusters, or groups of schools that jointly plan and administer professional development?
1 Yes
2 No (skip to 60)

57. How many of your district's Eisenhower-supported activities are planned at the CLUSTER LEVEL?
0 None
1 Some
2 Most
3 All

58. Which of the following people participate in making decisions about Eisenhower-supported activities planned at the cluster level?

a. Do principals?
b. Do lead teachers, resource teachers, or department chairs?
c. Do classroom teachers, through a formally organized committee?
d. Do teachers as individuals?
e. Do others (specify)?

60. How many of your district's Eisenhower-supported activities are planned at the SCHOOL LEVEL?
0 None
1 Some
2 Most
3 All

61. Which of the following people participate in making decisions about Eisenhower-supported activities planned at the school level?

a. Do principals?
b. Do lead teachers, resource teachers, or department chairs?
c. Do classroom teachers, through a formally organized committee?
d. Do teachers as individuals?
e. Do others (specify)?

63. Of the teachers in Eisenhower activities, what percent come to participate in each of the following ways?

a. What percent volunteer?
b. What percent are selected by their principal or other administrator?
c. What percent are selected by providers?
d. What percent participate by rotation?
e. What percent come to participate in other ways?

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EXHIBIT G.5.11d (Continued)

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

In-district workshops or institutes

71. Did your district support in-district workshops or institutes from July 1 through December 1977?
   1 Yes
   2 No (skip to 85)

72. Were any of your workshops or institutes supported, at least in part, with Eisenhower funds?
   1 Yes
   2 No (skip to 85)

76. How many participants attended, counting participants more than once if they attended multiple workshops/institutes?

78. For which of the following groups were workshops specifically designed? (circle all that apply)

Were they designed....

a. for teachers as individuals
b. for teachers as representatives of their departments, grade level, or school
c. for all teachers in department or grade-level groupings
d. for all teachers in a school or set of schools
e. in other configurations? (specify) ____________________

81. Which of the following strategies to help teachers implement new skills, if any, were used regularly in conjunction with Eisenhower workshops or institutes? (circle all that apply)

a. Did teachers observe leaders demonstrating or modeling skills
b. Did teachers observe other teachers teaching
c. Did teachers practice under simulated conditions, with feedback
d. Did teachers meet in groups and discuss problems in implementation
e. Were teachers observed teaching a regular class?
f. Other (please specify) ________________________
g. No strategies were used

83. Including follow-up events, approximately what percent of your Eisenhower-supported workshops or institutes lasted:

a. Less than 4 hours _______%
b. Between 4 - 8 hours _______%
c. Between 9 - 40 hours _______%
d. More than 40 hours _______%

84. Including follow-up activities, approximately what percent of these workshops or institutes were:

a. Spread over one day _______%
b. Spread over two to seven days _______%
c. Spread over eight days to one month _______%
d. Spread over more than one month to one year _______%
e. Spread over more than a year _______%

EXHIBIT G.5.11d (Continued)

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

Out-of-district workshops or institutes

85. Did your district support out-of-district workshops or institutes from July 1 through December 1977?
   1 Yes
   2 No (skip to 95)

86. Did you use Eisenhower funds to support teachers in attending out-of-district workshops or conferences?
   1 Yes
   2 No (skip to 95)

88. How many teachers did Eisenhower funds support to attend out-of-district workshops or conferences from July 1 through December 1997?

College courses

95. Did your district support attendance at college courses from July 1 through December 1977?
   1 Yes
   2 No (skip to 99)

96. Did you use Eisenhower funds to support teachers in taking college courses?
   1 Yes
   2 No (skip to 99)

98. How many teachers did you support for college courses with Eisenhower funds from July 1 through December 1997?

Teacher collaboratives or networks

99. Did your district support participation in teacher collaboratives or networks from July 1 through December 1977?
   1 Yes
   2 No (skip to 107)

100. Were any teacher collaboratives or networks supported, at least in part, with Eisenhower funds?
   1 Yes
   2 No (skip to 107)

102. How many teachers did Eisenhower funds support to participate in such collaboratives or networks from July 1 through December 1997?

106. Over what time period did the typical teacher participate in these networks?

   a. One month or less
   b. More than one month but less than six months
   c. Between six months and one year, or
   d. More than one year

Internship or immersion activities

107. Did your district support internship or immersion activities from July 1 through December 1977?
   1 Yes
   2 No (skip to 114)

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EXHBIT G.5.11d (Continued)

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

108. Were any internship or immersion activities supported, at least in part, with Eisenhower funds?
    1 Yes
    2 No (skip to 114)

110. How many teachers did Eisenhower funds support to participate in immersion activities from July 1 through December 1997?

111. How long did the typical immersion activity last?

    a. One day or less
    b. More than one day but less than one week
    c. Between one week and one month, or
    d. Longer than one month

Mentoring, coaching, or observation

114. Did your district support mentoring, coaching, or observation activities from July 1 through December 1977?
    1 Yes
    2 No (skip to 122)

115. Were any mentoring/coaching/observing activities supported, at least in part, with Eisenhower funds?
    1 Yes
    2 No (skip to 122)

118. How many teachers were mentored, coached, or observed from July 1 through December 1997 using Eisenhower funds?

121. How long did the typical mentor- or coach-teacher relationship last?

    a. One day or less
    b. More than one day but less than one week
    c. More than one week but less than one month
    d. Between one month and one year, or
    d. More than one year

Teacher resource center

122. Did your district support a teacher resource center from July 1 through December 1977?
    1 Yes
    2 No (skip to 127)

123. Did you use Eisenhower funds to support the teacher resource center?
    1 Yes
    2 No (skip to 127)

124. About how many teachers used the teacher resource center from July 1 through December 1997?

EXHIBIT G.5.11d (Continued)

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

Teacher committees or task forces

127. Did your district support teacher committees or task forces to improve teaching and learning from July 1 through December 1977?
    1 Yes
    2 No (skip to 135)

128. Were any teacher committees or task forces supported, at least in part, with Eisenhower funds?
    1 Yes
    2 No (skip to 135)

130. How many such groups did Eisenhower funds support from July 1 through December 1997?

131. About how many teachers participated in the typical committee or task force?

134. Over what period of time did the typical task force or committee meet?

    a. One day or less
    b. More than one day but less than one week
    c. More than one week but less than one month
    d. Between one month and one year, or
    d. More than one year

Teacher study groups

135. Did your district support teacher study groups from July 1 through December 1977?
    1 Yes
    2 No (skip to 142)

136. Were any teacher study groups supported, at least in part, with Eisenhower funds?
    1 Yes
    2 No (skip to 142)

138. How many such groups did Eisenhower funds support from July 1 through December 1997?

139. About how many teachers participated in the typical study group?

141. Over what period of time did the typical study group meet?

    a. One day or less
    b. More than one day but less than one week
    c. More than one week but less than one month
    d. Between one month and one year, or
    d. More than one year

EXHIBIT G.5.11d (Continued)

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

Individual research projects

142. Did your district support individual research projects from July 1 through December 1977?
    1 Yes
    2 No (skip to 147)

143. Were any individual research projects supported, at least in part, with Eisenhower funds?
    1 Yes
    2 No (skip to 142)

145. How many such projects did Eisenhower funds support from July 1 through December 1997?

146. How long did the typical research project last?

    a. One week or less
    b. More than one week to a month
    c. More than a month to a year
    d. More than a year

Other professional development

147. Did your district support any other professional development from July 1 through December 1977?
    1 Yes
    2 No (skip to 150)

148. Did you use Eisenhower funds to support any of these activities?
    1 Yes
    2 No (skip to 142)

Systemic reform efforts and the Eisenhower Program

154. Have STATE-WIDE standards or curriculum frameworks in MATHEMATICS been adopted?
    1 Yes
    2 No (skip to 156)

155. To what extent are Eisenhower-supported activities in your district designed to help teachers adapt their teaching to meet STATE-WIDE standards or frameworks in MATHEMATICS?

    a. The activities are not at all designed to help teachers adapt their teaching to these statewide mathematics standards and frameworks
    b. The activities are designed to some extent to do this, or
    c. The activities are designed to a large extent to do this

156. Have DISTRICT-WIDE standards or curriculum frameworks in MATHEMATICS been adopted?
    1 Yes
    2 No (skip to 159)

EXHIBIT G.5.11d (Continued)

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

157. To what extent are Eisenhower-supported activities in your district designed to help teachers adapt their teaching to meet DISTRICT-WIDE standards or frameworks in MATHEMATICS?

   a. The activities are not at all designed to help teachers adapt their teaching to these district-wide mathematics standards and frameworks
   b. The activities are designed to some extent to do this, or
   c. The activities are designed to a large extent to do this

154. Have STATE-WIDE standards or curriculum frameworks in SCIENCE been adopted?
   1 Yes
   2 No (skip to 156)

155. To what extent are Eisenhower-supported activities in your district designed to help teachers adapt their teaching to meet STATE-WIDE standards or frameworks in SCIENCE?

   a. The activities are not at all designed to help teachers adapt their teaching to these statewide science standards and frameworks
   b. The activities are designed to some extent to do this, or
   c. The activities are designed to a large extent to do this

156 Have DISTRICT-WIDE standards or curriculum frameworks in SCIENCE been adopted?
   1 Yes
   2 No (skip to 159)

157. To what extent are Eisenhower-supported activities in your district designed to help teachers adapt their teaching to meet DISTRICT-WIDE standards or frameworks in SCIENCE?

   a. The activities are not at all designed to help teachers adapt their teaching to these district-wide science standards and frameworks
   b. The activities are designed to some extent to do this, or
   c. The activities are designed to a large extent to do this

165. Are STATE-WIDE assessments in MATHEMATICS administered in your district?
   1 Yes
   2 No (skip to 167)

166. To what extent are Eisenhower-supported activities in your district designed to help teachers adapt their teaching to meet STATE-WIDE assessment requirements in MATHEMATICS?

   a. The activities are not at all designed to help teachers adapt their teaching to these statewide mathematics assessment requirements
   b. The activities are designed to some extent to do this, or
   c. The activities are designed to a large extent to do this

167. Does your district administer DISTRICT-WIDE assessments in MATHEMATICS?
   1 Yes
   2 No (skip to 170)

EXHIBIT G.5.11d (Continued)

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

168. To what extent are Eisenhower-supported activities in your district designed to help teachers adapt their teaching to meet DISTRICT-WIDE assessment requirements in MATHEMATICS?

    a. The activities are not at all designed to help teachers adapt their teaching to these district-wide mathematics assessment requirements
    b. The activities are designed to some extent to do this, or
    c. The activities are designed to a large extent to do this

170. Are STATE-WIDE assessments in SCIENCE administered in your district?
    1 Yes
    2 No (skip to 172)

166. To what extent are Eisenhower-supported activities in your district designed to help teachers adapt their teaching to meet STATE-WIDE assessment requirements in SCIENCE?

    a. The activities are not at all designed to help teachers adapt their teaching to these statewide science assessment requirements
    b. The activities are designed to some extent to do this, or
    c. The activities are designed to a large extent to do this

167. Does your district administer DISTRICT-WIDE assessments in SCIENCE?
    1 Yes
    2 No (skip to 170)

168. To what extent are Eisenhower-supported activities in your district designed to help teachers adapt their teaching to meet DISTRICT-WIDE assessment requirements in SCIENCE?

    a. The activities are not at all designed to help teachers adapt their teaching to these district-wide science assessment requirements
    b. The activities are designed to some extent to do this, or
    c. The activities are designed to a large extent to do this

EXHIBIT G.5.11d (Continued)

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

PART B

Now I'd like to ask about various Federal programs that may operate in your state or district, and the relationship between these programs and the Eisenhower program.

5-61. Please answer the following questions about these Federal programs. (Items number from 5 to 61, beginning with first row) [Interviewer: Ask each question about SSI, then about USI, etc.]

	Did [PROGRAM] operate in your state or district last year?	Did it support professional development in your district last year?	Did the program co-fund professional development with Eisenhower in the last year?	Did program staff work closely with Eisenhower staff in the last year?
National Science Foundation: Statewide Systemic Initiative	Y N Don't know	Y N	Y N	Y N
National Science Foundation: Urban Systemic Initiative	Y N Don't know	Y N	Y N	Y N
National Science Foundation: Rural Systemic Initiative	Y N Don't know	Y N	Y N	Y N
National Science Foundation: Local Systemic Change	Y N Don't know	Y N	Y N	Y N
Title I: Part A (Helping Disadvantaged Children)	Y N Don't know	Y N	Y N	Y N
Title I: Part C (Education of Migrant Children)	Y N Don't know	Y N	Y N	Y N
Title III: Technology for Education	Y N Don't know	Y N	Y N	Y N
Title IV: Innovative Education Program Strategies	Y N Don't know	Y N	Y N	Y N
Title VII: Bilingual Education	Y N Don't know	Y N	Y N	Y N
Title IX: Indian Education	Y N Don't know	Y N	Y N	Y N
Individuals with Disabilities Education Act (IDEA)	Y N Don't know	Y N	Y N	Y N
Goals 2000	Y N Don't know	Y N	Y N	Y N
School to work programs	Y N Don't know	Y N	Y N	Y N
Perkins Vocational Education Funds	Y N Don't know	Y N	Y N	Y N
Other (please explain)	Y N Don't know	Y N	Y N	Y N

EXHIBIT G.5.11d (Continued)

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

Targeting and recruitment

65-74: How much emphasis do you give to recruiting:

		No Particular Emphasis	Some Emphasis	Strong Emphasis
a.	Teachers from Title I schools	0	1	2
b.	Title I teachers	0	1	2
c.	Special education teachers	0	1	2
d.	Teachers of limited English proficiency students	0	1	2
e.	Teachers from schools with low achievement levels	0	1	2
f.	Teachers from high poverty schools (50% or more students eligible for free/reduced price lunch)	0	1	2
g.	Paraprofessionals	0	1	2
h.	Other (specify) ______________	0	1	2

75. In which of the following ways do you try to increase the participation of teachers, paraprofessionals, or other populations? (circle all that apply)

Do you....

a. Publicize activities
b. Tailor the focus of professional development towards the needs of special population
c. Use incentives
d. Do you use other strategies?
e. No special strategies are used

Processes and procedures

78. Are teachers' needs for professional development formally assessed?
1 Yes
2 No (skip to 82)

79. In which of the following ways are teachers' needs for professional development assessed? (circle all that apply)

a. With a survey of teachers
b. With meetings of teacher representatives
c. With a survey of principals or department chairs
d. With measures of student performance
e. With informal conversations
f. Are teachers' needs assessed in other ways (please specify)

EXHIBIT G.5.11d (Continued)

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

83. Do you evaluate Eisenhower-supported professional development?
   1 Yes
   2 No (skip to 85)

84. In which of the following ways do you evaluate Eisenhower-supported professional development? (circle all that apply0

With or by....

a. By number of teachers participating in professional development
b. With a teacher satisfaction survey
c. With observations of teachers
d. With student achievement scores
e. In other ways (please specify)

88. Has your DISTRICT developed performance indicators for professional development?
   1 Yes
   2 No (skip to 90)

89. Is your DISTRICT currently developing performance indicators for professional development?
   1 Yes
   2 No (skip to 96)

142. Do district Eisenhower staff EXCHANGE IN INFORMATION with SCHOOLS regarding professional development?
   1 Yes
   2 No (skip to 144)

143. In which of the following ways do district Eisenhower staff exchange information with schools regarding professional development? (circle all that apply)

Through....

a. Regular visits and observations
b. Telephone calls to schools
c. Regular required reports from schools
d. Required evaluations of school-level professional development programs
e. In other ways (please specify)

144. Do district Eisenhower staff provide assistance to schools?
   1 Yes
   2 No (skip to 146)

EXHIBIT G.5.11d (Continued)

Items from District Telephone Interview Used in Analyses Reported in Chapters 4 and 5

145. Which of the following kinds of assistance do they provide? (all that apply)

Do they....

a. Provide guidance in interpreting Title II rules and regulations
b. Help conducting needs assessments
c. Help developing professional development plan
d. Help developing specific activities
e. Help developing performance indicators for professional development
f. Assist in other ways (please specify)

146. Do district Eisenhower staff EXCHANGE INFORMATION with professional development providers?
1 Yes
2 No (skip to 148)

147. In which of the following ways do they exchange information?

Through....

a. Regular visits and observations of professional development activities
b. Telephone calls to professional development providers
c. Regular required reports from providers
d. Required evaluations of professional development activities
e. Other ways (please specify)

148. Do district Eisenhower staff provide assistance to professional development providers?
1 Yes
2 No (skip to 150)

149. Which of the following kinds of assistance do district Eisenhower staff provide to professional development providers?

Do they

a. Provide guidance in interpreting Title II rules and regulations
b. Help conducting needs assessments
c. Help developing professional development plans
d. Help developing specific activities
e. Help developing performance indicators for professional development
f. Assist in other ways (please specify)

APPENDIX H

SUPPLEMENT FOR CHAPTER 6

This appendix provides supplementary information for the analyses reported in Chapter 6. Each Exhibit in the appendix corresponds to an Exhibit of the same number in Chapter 6. The boxes at the bottom of each Exhibit refer to SAHE-grantee Project Director Telephone Survey item numbers or composite variables on which the exhibit is based. Eisenhower Project Director Survey item numbers begin with the letter "E," followed by the section of the survey (part A or B) and the item involved. For example, item numbers "EA069_1, EA069_2, and EA069_3" refer to the Project Director Survey part A, item 69_1, 2, and 3. (Item 69_1 is shown on printed copies of the survey as 69a, 69_2 is shown as 69b, etc.) All items referred to in the chapter appear in Exhibit 6.26d. Composite variables, which appear in all capital letters (for example, PDIRT), are defined in Exhibit 6.26b.

EXHIBIT H.6.2

Percent of Teachers Participating in SAHE-grantee Projects with Primary Activities that Cover Mathematics, Science, and Other Subject Areas (n=92)

Subject Areas	Percent of Teachers Participating in SAHE-grantee Activities
Mathematics Only	27.1
Science Only	18.5
Mathematics/Science	18.3
Mathematics/Science/Other	28.2
Other Only	8.0

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998
Variables: EA069_1—EA069_3

EXHIBIT H.6.3

Percent of Teachers Participating in SAHE-grantee Projects that Offer "Traditional" Activities (n=92)

Types of "Traditional" Activities	Offer Activity	Offer Activity as Primary Focus
College course	38.0	26.1
Workshops	76.3	55.3

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EA067, EB005, EB008, EB011

EXHIBIT H.6.4

Percent of Teachers Participating in SAHE-grantee Projects that Offer "Reform" Activities (n=92)

Types of "Reform" Activities	Offer Activity	Offer Activity as Primary Focus
Study Group	25.1	4.0
Teacher Networking	43.0	8.9
Mentoring	40.6	1.6
Committee or Task Force	15.4	0.0
Internship	6.8	0.0
Individual Research	11.9	0.0
Resource Center	32.0	0.0

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: Responses combine primary activity (EA067_5 -- EA067_11) and other activities (B014, B016, B018, B020, B022, B024, B026) stud_all, stud_pri, net_all, net_pri, ment_all, ment_pri, comm_all, comm_pri, intn_all, intn_pri, proj_all, proj_pri, reso_all, reso_pri

EXHIBIT H.6.5

SAHE-grantees' Support for "Reform" Types of Activities, Overall and by Institution Type and Departmental Affiliation (n=92)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where p ≤ .05)*		
IHE Overall	13.85	(35.00)	86						
Institutional Type				2.72	1.80	.10			
Research	9.88	(33.77)	31						
Other	16.97	(35.70)	55						
Dept. Affiliation				3.73	2.80	.02	Math/Science	Education	Other
Math/Science	1.96	(13.93)	42						
Education	22.09	(45.16)	30				X		
Other	31.94	(43.94)	14				X		
Inst*Dept				1.11	2.80	.33			
NPO Overall	27.62	(43.37)	6						

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998
Variables: NET_REF

EXHIBIT H.6.6a

Percent of Teachers Participating in SAHE-grantee Projects, by Contact Hours of Primary Activity (n=92)

Number of Hours of Primary Activity	Percent of Teachers Participating in SAHE-grantee Activities
Less than 4	1.48
4 to 8	9.5
9 to 40	31.52
40 or more	57.5

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: Amount-(=EA080)

EXHIBIT H.6.6b

Contact Hours of SAHE-grantees' Primary Activity, Overall and by Institution Type and Departmental Affiliation (n=92)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where $p \le .05$)*		
IHE Overall	64.11	95.14	86						
Institutional Type				1.15	1, 80	.28			
Research	82.32	(151.26)	31						
Other	49.78	(33.41)	55						
Dept. Affiliation				3.71	2, 80	.02	Math/Science	Education	Other
Math/Science	44.74	(36.32)	42						
Education	98.36	(148.53)	30						
Other	31.53	(23.94)	14						
Inst*Dept				4.45	2, 80	.01			
NPO Overall	27.37	(15.48)	6						

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Scale Definition: amount_i=ea080
Variables: EA080

EXHIBIT H.6.6c

Contact Hours of SAHE-grantees' Primary Activity, Interaction of Institution Type and Departmental Affiliation (n=86)

Departmental Affiliation	Research/Doctoral	SD	Other	SD
Math/Science	26.45	(29.71)	58.36	(34.28)
Education	140.37	(198.81)	56.19	(34.71)
Other	49.48	(35.14)	26.77	(17.51)

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Scale Definition: amount_i=ea080
Variables: EA080

EXHIBIT H.6.7a

Percent of Teachers Participating in SAHE-grantee Projects, by Time Span of Primary Activity (n=92)

Span of Primary Activities	Percent of Teachers Participating in SAHE-grantee Activities
1 day	6.94
2-7 days	7.69
8 days to 1 month	6.54
1 month to 1 year	52.27
>1 year	26.57

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EA077 (# span_i)

EXHIBIT H.6.7b

Span of SAHE-grantees' Primary Activity, Overall and by Institution Type and Departmental Affiliation (n=92)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where p ≤ .05)*		
IHE Overall	3.83	(1.14)	86						
Institutional Type				0.83	1, 80	0.37			
Research	3.96	(1.40)	31						
Other	3.73	(0.97)	55						
Dept. Affiliation				7.24	2, 80	0.00	Math/Science	Education	Other
Math/Science	3.38	(1.43)	42						
Education	4.31	(0.55)	30				X		
Other	4.04	(0.38)	14						
Inst*Dept				.84	2, 80	.43			
NPO Overall	3.88	(0.53)	6						

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EA077 (=span_i)

EXHIBIT H.6.8a

Percent of Teachers Participating in SAHE-grantee Projects Whose Primary Activity Involves Collective Participation (n=92)

Types of Participants	Percent
All teachers in a school	14.34
All teachers in department or grade	15.24

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EA097_3, EA097_4

EXHIBIT H.6.8b

Collective Participation in SAHE-grantee Projects, Overall and by Institution Type and Departmental Affiliation (n=92)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where $p \leq .05$)*
IHE Overall	0.15	(0.34)	86				
Institutional Type				8.09	1, 80	.00	
Research	0.24	(0.40)	31				
Other	0.08	(0.23)	55				
Dept. Affiliation				3.21	2, 80	.04	Math/Science Education Other
Math/Science	0.12	(0.32)	42				
Education	0.14	(0.34)	30				
Other	0.31	(0.42)	14				
Inst*Dept				0.90	2, 80	.41	
NPO Overall	0.00	(0.00)	6				

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Scale Definition: SCH_BS_I= mean(EA097_3, EA097_4)
Scale Reliability: .76
Variables: SCH_BS_I

EXHIBIT H.6.9a

Percent of Teachers Participating in SAHE-grantee Projects Whose Primary Activity Focuses on Content Knowledge (n=92)

Extent of Content Knowledge Focus	**Percent**
No emphasis	5.30
Some emphasis	23.02
Strong emphasis	71.68

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: content_I

EXHIBIT H.6.9b

Extent of Content Knowledge Focus in SAHE-grantees' Primary Activity, Overall and by Institution Type and Departmental Affiliation (n=92)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where $p \leq .05$)*
IHE Overall	2.67	(0.56)	86				
Institutional Type				3.28	1, 80	.07	
Research	2.78	(0.64)	31				
Other	2.58	(0.50)	55				
Dept. Affiliation				.58	2, 80	.56	Math/Science Education Other
Math/Science	2.74	(0.61)	42				
Education	2.62	(0.52)	30				
Other	2.52	(0.47)	14				
Inst*Dept				5.55	2, 80	.00	
NPO Overall	2.52	(0.80)	6				

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: Content 1

EXHIBIT H.6.9c

Extent of Content Knowledge Focus in SAHE-grantees' Primary Activity, by Institution Type and Departmental Affiliation (n=86)

Departmental Affiliation	Research/Doctoral	Other
Math/Science	2.63 (.95)	2.83 (.42)
Education	2.91 (.32)	2.29 (.48)
Other	2.84 (.32)	2.44 (.50)

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EA092

EXHIBIT H.6.10a

Percent of Teachers Participating in SAHE-grantee Projects that Provide Each of Sixteen Types of Opportunities for Active Learning in Primary Activity (n=92)

Types of active learning	Percent
Score Assessments	22.03
Participant Leads Whole Group Discussion	45.35
Participants Observe Others Teaching	46.56
Review Student Work	47.99
Participants Simulate Practice	56.50
Participants Receive Coaching	56.56
Leader Observes Participants Teaching	61.45
Participant Develops Curriculum	63.44
Participant Gives Lecture	65.04
Participants Write Paper	67.59
Informal Meetings	69.57
Participant Leads Small Discussion	70.74
Participant Conducts Demonstration	70.82
Communication with Teacher	78.91
Participants Discuss Implementation	81.64
Participants Share Work	82.68

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EA075_1-9, EA108_5, 6, 7, 8, 10, 12, and 13

EXHIBIT H.6.10b

Number of Types of Opportunities for Active Learning in SAHE–grantees' Primary Activity, Overall and by Institution Type and Departmental Affiliation (n=92)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where p ≤ .05)*
IHE Overall	9.8	(3.49)	86				
Institutional Type				.09	1, 80	0.77	
Research	9.71	(4.26)	31				
Other	9.94	(3.00)	55				
Dept. Affiliation				5.70	2, 80	.00	Math/Science Education Other
Math/Science	8.64	(3.62)	42				
Education	10.8	(3.35)	30				*Significant interaction effects*
Other	11.23	(2.08)	14				
Inst*Dept				7.28	2, 80	.00	
NPO Overall	10.32	(4.55)	6				

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Scale Definition: ACTIVE_I= sum(EA075_1,EA075_2,EA075_3,EA075_4,EA075_5,EA075_6,EA075_7,EA075_8, EA075_9, EA108_5,EA108_6,EA108_7, EA108_8, EA108_10, EA108_12, EA108_13)
Scale Reliability: .77
Variables: ACTIVE_I

EXHIBIT H.6.10c

Number of Types of Opportunities for Active Learning in SAHE-grantees' Primary Activity, Interaction of Institution Type and Departmental Affiliation (n=86)

Departmental Affiliation	Research/Doctoral	SD	Other	SD
Math/Science	7.1	(4.55)	9.8	(2.85)
Education	12.1	(2.32)	9.3	(3.61)
Other	10.5	(2.09)	11.4	(2.15)

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: ACTIVE_I

EXHIBIT H.6.11

Percent of Teachers Participating in SAHE-grantee Projects Whose Directors Report Placing No, Some, or a Strong Emphasis on Recruiting Teachers of Special Student Populations (n=92)

Teachers by Type of School or Type of Students	Strong Emphasis	Some Emphasis	No Emphasis
Title I Schools	18.37	36.74	44.89
Special Education	3.84	27.29	68.87
Limited English	3.59	24.73	71.67
Low Achievement	41.69	28.55	29.76
High Poverty	41.72	29.74	28.54

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EB036 EB037 EB038 EB039 EB040

EXHIBIT H.6.12

Percent of Teachers Participating in SAHE-grantee Projects, According to How Teachers Come to Participate (n=92)

Types of Participation	Percent
Volunteer	78.43
Principal selected	20.05
Provider selected	1.55
Rotation	.34
Other	.42

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EB031_1 – EB031_5

EXHIBIT H.6.13

Percent of Teachers Participating in SAHE-grantee Projects That Use Various Strategies to Increase Participation (n=92)

Strategies	Percent
Publicize Activities	82.62
Tailor Focus	50.40
Use Incentives	50.82
Other	18.11

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EB043_1 – EB043_4

EXHIBIT H.6.14a

Percent of Teachers Participating in SAHE-grantee Projects in which State and District Standards and Assessments Play a Role in Project Design (n=92)

Types of "Reform" Activities	Standards Play a Role	Assessments Play a Role
State	92.21	57.31
District	61.64	39.80

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EA032, EA033, EA034, EA035

EXHIBIT H.6.14b

Degree of Alignment between SAHE-grantees' Eisenhower Project and State and District Standards and Assessments, Overall and by Institution Type and Departmental Affiliation (n=92)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where $p \leq .05$)*
IHE Overall	2.50	(1.32)	86				
Institutional Type				7.66	1, 80	.00	
Research	2.05	(1.57)	31				
Other	2.86	(1.06)	55				
Dept. Affiliation				1.52	2, 80	.22	Math/Science Education Other
Math/Science	2.29	(1.42)	42				
Education	2.69	(1.28)	30				
Other	2.72	(1.09)	14				
Inst*Dept				2.08	2, 80	.13	
NPO Overall	2.56	(1.14)	6				

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Scale Definition: Align_i = sum(EA032,EA033,EA034,EA035)
Scale Reliability: .59
Variables: ALIGN_I

EXHIBIT H.6.15

Percent of Teachers Participating in SAHE-grantee Projects That have Ongoing Feedback Mechanisms with Districts (n=92)

Feedback Mechanisms	**Percent**
Regularly Required Reports	14.17
Professional Development Evaluation	17.96

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EB059_3, EB059_4

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EXHIBIT H.6.16

Percent of Teachers Participating in SAHE-grantee Projects That Support and Coordinate with District Professional Development Activities and Programs (n=92)

Type of SAHE-grantee Coordination with Districts	Percent
Support or Extend District Activities	73.76
Coordinate with District Programs	24.24

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EA025, EA062

EXHIBIT H.6.17

Percent of Teachers Participating in SAHE-grantee Projects That Work with Districts in Different Ways (n=92)

Ways SAHE Grantees Work with Districts	Percent
Participate in District Planning	52.95
Communicate with Staff	90.07
Use District Needs Assessment	70.80
Regular District Visits	37.66
Other Ways	64.46

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: EA024_1—EA024_4, EB059_1

EXHIBIT H.6.18

Percent of Teachers Participating in SAHE-grantee Projects in Which District Staff Are Involved in Planning, Implementing, or Monitoring Eisenhower-assisted Activities (n=92)

Types of People With Whom SAHE Grantees Work	Percent
District Eisenhower Coordinators	23.84
Other District Administrators	52.64

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: peopinvi = EA030_1N, EA030_2N

EXHIBIT H.6.19

Percent of Teachers Participating in SAHE-grantee Projects That Co-fund and/or Work Closely with Other Federal Programs (When the Program Operates in the District) (n=92)

Federal Programs	Operates in state/district	Supports professional development	Co-funds with	Works closely with
SSI	28.2	90.7	27.2	45.9
USI	7.0	80.6	15.0	61.5
RSI	3.4	90.0	0	80.9
LSC	3.5	100.0	61.4	76.0
Title I, Part A	63.5	83.3	37.4	22.4

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: work closely: EA040 EA044 EA048 EA052 EA056; Co-fund: EA039 EA043 EA047

EXHIBIT H.6.20

Number of Types of Coordination of SAHE-grantee Projects with Districts, Overall and by Institution Type and Departmental Affiliation (n=92)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where $p \leq .05$)*		
IHE Overall	5.52	(2.44)	86						
Institutional Type				2.80	1, 80	.09			
Research	5.03	(3.32)	31						
Other	5.90	(1.73)	55						
Dept. Affiliation				6.74	2, 80	0.00	Math/Science	Education	Other
Math/Science	4.82	(2.30)	42						
Education	6.51	(2.54)	30				X		
Other	5.07	(1.90)	14						
Inst*Dept					2, 80				
NPO Overall	5.50	(1.84)	6						

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: COORDI

EXHIBIT H.6.21

Percent of Teachers Participating in SAHE-grantee Projects, by Status and Effect of District and State Performance Indicators on the Project (n=92)

Status of State and District Performance Indicators	Percent
State Has Performance Indicators	49.6
Given State Indicators, Effect on Eisenhower	76.5
District Developed at Least Some Performance Indicators	39.6
Given District Indicators, Effect on Eisenhower	21.5

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998
Variables: EB049 EB051 EB052 EB055

EXHIBIT H.6.22

Percent of Teachers Participating in SAHE-grantee Projects That Use Different Strategies to Assess Teachers' Professional Development Needs (n=92)

Needs Assessment Methods	Percent
Teacher Survey	50.7
Teacher Representative Meeting	40.7
Principal Survey	19.2
Measure Student Performance	23.6
Informal Conversation	50.0

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998
Variables: EB046_1 – EB046_5

EXHIBIT H.6.23

Percent of Teachers Participating in SAHE-grantee Projects That Use Different Methods for Evaluating Activities (n=92)

Evaluation Methods	Percent
Teacher Participation	61.1
Teacher Survey	91.9
Observe Teachers	59.3
Student Achievement	30.6

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998
Variables: EB048_1 – EB048_4

EXHIBIT H.6.24

Extent of SAHE-grantee Continuous Improvement Efforts, Overall and by Institution Type and Departmental Affiliation (n=92)

	Mean	*SD*	*n*	*F*	*df*	*p*	*Significant Tukey Pairwise Contrasts (where $p \le .05$)*		
IHE Overall	1.38	(0.80)	86						
Institutional Type				8.79	1, 80	0.00			
Research	1.17	(0.87)	31						
Other	1.55	(0.73)	55						
Dept. Affiliation				20.77	2, 80	0.00	Math/Science	Education	Other
Math/Science	0.91	(0.50)	42						
Education	1.83	(0.73)	30				X		
Other	1.71	(0.93)	14				X		
Inst*Dept				.88	2, 80	.42			
NPO Overall	1.76	(0.64)	6						

Source: Telephone Survey of SAHE-grantee Project Directors, Spring 1998.
Variables: CONIMP_1

EXHIBIT H.6.25a

Relationship of SAHE-grantee Implementation to Design and Characteristics of Professional Development

	Dependent Variables[a]								
	Align	Coordinate	Reform	Continuous Improvement	Time Span	Contact Hours	Collective Participation	Active Learning	Targeting
Non-research/Doctoral Institution	.26*	.21	.09	.26**	-.25*	-.26*	-.35**	-.07	.05
	.68	1.03	.08	.40	-.51	-49.80	-.24	-.43	.04
	(.29)	(.53)	(.09)	(.15)	(.22)	(19.33)	(.08)	(.67)	(.10)
NPO	.07	.12	.03	.08	-.11	-.12	-.35**	-.09	.02
	.37	1.24	.05	.25	-.47	-51.81	-.53	-1.19	.05
	(.72)	(1.31)	(.22)	(.36)	(.53)	(45.40)	(.18)	(1.57)	(.24)
Mathematics/Science Department	-.08	.01	-.16	-.48***	-.13	.14	-.29	-.15	.18
	-.21	.07	-.13	-.74	-.26	26.40	-.20	-.93	.17
	(.42)	(.77)	(.14)	(.21)	(.33)	(28.62)	(.12)	(.99)	(.15)
Education Department	.03	.35*	.09	.07	.15	.12	-.45**	.02	.17
	.08	1.78	.07	.11	.32	23.75	-.32	.12	.16
	(.44)	(.81)	(.14)	(.22)	(.33)	(28.83)	(.12)	(1.00)	(.15)
Alignment			.10		.15	-.14	-.18	.06	.05
			.03		.11	-10.52	-.05	.14	.02
			(.04)		(.09)	(7.83)	(.03)	(.27)	(.04)
Coordination			-.27*		-.30*	.48***	.32*	.07	.13
			-.04		-.13	18.89	.05	.09	.02
			(.02)		(.05)	(4.51)	(.02)	(.16)	(.02)
Continuous Improvement			.21		.24	.20	.08	.34**	.39**
			.11		.33	24.96	.04	1.39	.24
			(.07)		(.17)	(14.68)	(.06)	(.51)	(.08)
R^2	6.7	12.1	13.5	31.7	22.9	34.7	20.6	25.0	24.5

Note: [a] For each dependent variable, standardized regression coefficient (ß) is shown on the first line; unstandardized regression coefficient (b) on the second line; standard error (in parentheses) on the third line.

* $p<.05$; ** $p<.01$; *** $p<.001$

EXHIBIT H.6.25b

Variable Definitions

Variables	Symbol	Coding
Non-research/doctoral institution		Based on EA006, dummy coded: research or doctoral institution=0, all others=1
NPO	A005	NPO=1, institution of higher education=0
Mathematics/science department		Baesd on EA007, dummy coded: math or science department=1, all others=0
Education department		Based on EA007, dummy coded: education school or department=1, all others=0
Alignment	ALIGN_I	EA032+EA033+EA034+EA035 Reliability=.59
Coordination	COORD_I	Sum of five scales: COFUND_I, REQUIRE_I, SUPEXT_I, WORKWD_I, AND PEOPINVI, defined as follows, with each variable dummy coded: COFUND_I=EA039+EA043+EA047+EA051+EA055 REQUIRE_I = EB059_3+EB059_4 SUPEXT_I=EA025+EA062 WORKWD_I=EAO24_1+EA024_2+EA024_3+EA024_4+EB059_1 PEOPINVI=EA030_1+EA030_2 Reliability=.48
Reform vs Traditional	REFM_PRI	Percent of support for reform-type activities
Continuous Improvement	CONIMP_I	
Time Span	EA077	Coded one day=1 through more than one year=5
Contact Hours	EA080	Coded in hours
Collective Participation	SCH_BS_I	(EA097_3+EA097_4)/2, with each variable dummy coded
Active learning	ACTIVE_I	Sum of EA075_1 – EA075_9 and ea108_5, 6, 7, 8, 10, 12, and 13, each dummy coded
Targeting		(EB036+EB037+EB038+EB039+EB040)/5, with each item coded 1=no emphasis, 2=some emphasis, 3=strong emphasis

EXHIBIT H.6.25c

Correlations among SAHE-grantee Professional Development Variables

	Non-Research	NPO	Math/Sci Dept	Ed Dept	Align	Coordinate	Reform Type	Cont. Improve	Time Span	Contact Hours	Collective Participation	Active Learning	Targeting
Non-research/Doctoral Institution	1.00												
NPO	.25*	1.00											
Mathematics/Science Department	.08	-.21*	1.00										
Education Department	-.10	-.18	-.70***	1.00									
Alignment	.29**	.01	-.15	.11	1.00								
Coordination	.17	.00	-.26*	.32**	.53***	1.00							
Reform vs. Traditional Type	.07	.05	-.25*	.15	.06	-.05	1.00						
Continuous Improvement	.21*	.10	-.54***	.38***	.35***	.48***	.23*	1.00					
Time Span	-.10	.01	-.37***	.33**	.13	.03	.15	.28**	1.00				
Contact Hours	-.14	-.09	-.17	.30**	.11	.48***	-.10	.30**	.17	1.00			
Collective Participation	-.20	-.10	-.06	-.02	-.06	.17	-.16	.08	.20	.48***	1.00		
Active Learning	.02	.03	-.31**	.21*	.17	.28**	.17	.39***	.57**	.26*	.08	1.00	
Targeting	.14	-.02	-.17	.21*	.24*	.35***	.09*	.44***	.09	.36***	.23*	.19	1.00

Note. * *p*<.05; ** *p*<.01; *** *p*<.001

EXHIBIT H.6.25d

Items from SAHE-Grantee Project Director Telephone Interview Used in Analyses Reported in Chapter 6

SAHE-GRANTEE PROJECT DIRECTOR TELEPHONE INTERVIEW

NOTE: The IHE/NPO Project Director Interview was administered as a Computer-Assisted form, and the items as administered appeared on a computer screen. The following printed items parallel the versions that appeared on the CATI screen, but some details have been changed.

PART A

Eisenhower project

5. Which best describes your organization. Is it an institution of higher education or another not-for-profit organization?
   1. Institution for higher education
   2. Other not-for-profit organization

6. What type of college or university do you work in? Do you work in:
   1. A research institution
   2. A doctoral granting institution
   3. An institution that primarily grants bachelor's and master's degrees
   4. A private liberal arts institution
   5. A public two-year institution
   6. Another type of institution. Please specify

7. Which department, school, or center are you affiliated with at your institution? Are you affiliated with:
   1. The math department
   2. The science department
   3. The education school or department
   4. A research center
   5. Another department or school

24. How do you work with the district? Do you:
    a. Participate in district planning
    b. Communicate periodically with district staff
    c. Rely on district needs assessments to plan your project
    d. Work with the district in other ways
    e. Or do you not work very closely with the district

25. Is your professional development activity designed to support or extend other professional development activities in the district?
    1. Yes
    2. No

32. Did state standards and frameworks play a role in designing your project?
    1. Yes. If yes, how did they play a role?
    2. No

33. Did district standards and frameworks play a role in designing your project?
    1. Yes. If yes, how did they play a role?
    2. No

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EXHIBIT H.6.25d (Continued)

Items from SAHE-grantee Project Director Telephone Interview Used in Analyses Reported in Chapter 6

34. Did state assessments play a role in designing your project?
    1. Yes. If yes, how did they play a role?
    2. No

35. Did district assessments play a role in designing your project?
    1. Yes. If yes, how did they play a role?
    2. No

37. Did a National Science Foundation State Systemic Initiative operate in the last year in the districts with which you work?
    1. Yes
    2. No (skip to 41)
    3. Don't know (skip to 41)

38. Did the program support professional development last year in the districts with which you work?
    1. Yes
    2. No (skip to 40)

39. Did the program co-fund professional development last year with your Eisenhower project?
    1. Yes
    2. No

40. Did program staff work closely with your Eisenhower project staff in the last year?
    1. Yes
    2. No

41. Did a National Science Foundation Urban Systemic Initiative operate in the last year in the districts with which you work?
    1. Yes
    2. No (skip to 45)
    3. Don't know (skip to 45)

42. Did the program support professional development last year in the districts with which you work?
    1. Yes
    2. No (skip to 44)

43. Did the program co-fund professional development last year with your Eisenhower project?
    1. Yes
    2. No

44. Did program staff work closely with your Eisenhower project staff in the last year?
    1. Yes
    2. No

45. Did a National Science Foundation Rural Systemic Initiative operate in the last year in the districts with which you work?
    1. Yes
    2. No (skip to 49)
    3. Don't know (skip to 49)

EXHIBIT H.6.25d (Continued)

Items from SAHE-grantee Project Director Telephone Interview Used in Analyses Reported in Chapter 6

46. Did the program support professional development last year in the districts with which you work?
    1. Yes
    2. No (skip to 48)

47. Did the program co-fund professional development last year with your Eisenhower project?
    1. Yes
    2. No

48. Did program staff work closely with your Eisenhower project staff in the last year?
    1. Yes
    2. No

49. Did a National Science Foundation Local Systemic Initiative operate in the last year in the districts with which you work?
    1. Yes
    2. No (skip to 53)
    3. Don't know (skip to 53)

50. Did the program support professional development last year in the districts with which you work?
    1. Yes
    2. No (skip to 52)

51. Did the program co-fund professional development last year with your Eisenhower project?
    1. Yes
    2. No

52. Did program staff work closely with your Eisenhower project staff in the last year?
    1. Yes
    2. No

53. Did Title I, Part A (Helping Disadvantaged Children) operate in the last year in the districts with which you work?
    1. Yes
    2. No (skip to 57)
    3. Don't know (skip to 57)

54. Did the program support professional development last year in the districts with which you work?
    1. Yes
    2. No (skip to 56)

55. Did the program co-fund professional development last year with your Eisenhower project?
    1. Yes
    2. No

56. Did program staff work closely with your Eisenhower project staff in the last year?
    1. Yes
    2. No

EXHIBIT H.6.25d (Continued)

Items from SAHE-grantee Project Director Telephone Interview Used in Analyses Reported in Chapter 6

CHARACTERISTICS OF EISENHOWER-SUPPORTED ACTIVITIES – PRIMARY ACTIVITY

I would like now to ask about the characteristics of your Eisenhower-supported activities.

For our purposes, we have defined a single activity as an event with a common group of participants. For example, if four different groups of teachers attended the same workshop on four separate occasions, this would count as four activities. But if one group of teachers attended a workshop and a follow-up event, this would count as one activity.

64. Using this definition, how many Eisenhower-supported professional development activities did you lead from July1 through December 1997.

In the following questions, we will ask you to describe a professional development activity you provided using Eisenhower funds. If you provided more than one Eisenhower-supported activity, please pick your primary activity.

66. What is the name of your primary activity?

67. Which of the following best describes the activity? **Choose only one response**. If more than one response fits your activity, pick the response that best describes the aspect of the activity in which participants spend the most time.
    a. In-district workshop or institute
    b. Out-of-district workshop or institute
    c. Out-of-district conference
    d. College course
    e. Teacher collaborative or network
    f. Internship or immersion activity
    g. Mentoring, coaching, observation
    h. Teacher resource center
    i. Teacher committee or task force
    j. Teacher study group
    k. Individual research project
    l. Other (please specify)

69. On what subject areas did the activity focus? Did it focus on
    a. Mathematics
    b. Science
    c. Other subjects (specify)

74. As part of the professional development activity, including preliminary and follow-up sessions, did participants have the opportunity to try out what they learned in their classroom and obtain feedback?
    1. Yes
    2. No (skip to 77)

EXHIBIT H.6.25d (Continued)

Items from SAHE-grantee Project Director Telephone Interview Used in Analyses Reported in Chapter 6

75. How did this activity help participants use new skills in their classroom? (Circle all that apply.)
    a. Participants practiced under simulated conditions, with feedback
    b. Participants received coaching or mentoring in the classroom
    c. Participants met formally with other activity participants to discuss classroom implementation
    d. You or other activity leaders observed participants' teaching and provide feedback
    e. Participants' teaching was observed by other participants and feedback was provided
    f. Participants communicated with you concerning classroom implementation
    g. Participants shared their students' work which you or other participants reviewed
    h. Participants met informally with other participants to discuss classroom implementation
    i. Participants developed curricula or lesson plans, which you or other participants reviewed
    j. Other (specify) ______________________

77. Over what period of time was the activity spread, including the main activity and any formal preliminary or follow-up sessions?
    1. One day or less
    2. More than one day but less than one week
    3. More than one week but less than one month
    4. More than one month but less than one year, or
    5. More than one year

80. How many hours did the typical participant engage in as part of this activity? Include the main activity as well as any preliminary or formal follow-up sessions.

92. How much emphasis did the activity give to deepening content knowledge?
    1. No emphasis
    2. Some emphasis, or
    3. Strong emphasis

97. Which of the following groups participated in the activity? Did... (Circle all that apply)
    a. Teachers as individuals
    b. Teachers as representatives of their department, grade level, or school
    c. All teachers in department or grade-level groupings
    d. All teachers in a school or set of schools
    e. Other configurations (specify) ______________________

EXHIBIT H.6.25d (Continued)

Items from SAHE-grantee Project Director Telephone Interview Used in Analyses Reported in Chapter 6

108. Which of the following did participants engage in during the activity? Did they… (Circle all that apply)
   a. Listen to a lecture
   b. Observe a demonstration of a lesson or unit
   c. Participate in a whole-group discussion
   d. Participate in a small-group discussion
   e. Give a lecture or presentation
   f. Conduct a demonstration of a lesson or unit
   g. Lead a whole-group discussion
   h. Lead a small-group discussion
   i. Engage in extended problem solving
   j. Write a paper, report or plan
   k. Develop or review materials
   l. Reviewed student work
   m. Score assessments
   n. Collaborate as a colleague with mathematicians or scientists
   o. Use technology (computers, calculators, or the internet)
   p. Complete paper-and-pencil problems or exercises
   q. Assess other participants' knowledge or skills
   r. Engage in anything else? What else did participants engage in during the activity?

PART B

OTHER EISENHOWER-ASSISTED ACTIVITIES

4. Other than the activity you have been describing, did you support any other activities over the period from July 1, 1997 through December 31 using Eisenhower funds?
   1. Yes
   2. No (skip to 30)

5. Did you support in-district workshops or institutes (that is, workshops intended for teachers from a single district?)
   1. Yes
   2. No (skip to 8)

7. About how many teachers participated in these in-district workshops or institutes?

8. Did you support out-of-district workshops or conferences (that is, workshops intended for teachers from a multiple districts?)
   1. Yes
   2. No (skip to 11)

10. About how many teachers participated in these out-of-district workshops or conferences?

11. Did you support college courses for credit?
   1. Yes
   2. No (skip to 14)

13. About how many teachers participated in these college courses?

EXHIBIT H.6.25d (Continued)

Items from SAHE-grantee Project Director Telephone Interview Used in Analyses Reported in Chapter 6

14. Did you support teacher collaboratives or networks?
    1. Yes
    2. No (skip to 16)

15. About how many teachers participated in these teacher collaboratives or networks?

16. Did you support internships or immersion activities?
    1. Yes
    2. No (skip to 18)

17. About how many teachers participated in these internship or immersion activities?

18. Did you support mentoring, coaching, or observation?
    1. Yes
    2. No (skip to 20)

19. About how many teachers participated in these mentoring, coaching, or observation activities?

20. Did you support a teacher resource center?
    1. Yes
    2. No (skip to 22)

21. About how many teachers used this resource center?

22. Did you support teacher communities or task forces?
    1. Yes
    2. No (skip to 24)

23. About how many teachers participated in these committees or task forces?

24. Did you support teacher study groups?
    1. Yes
    2. No (skip to 26)

25. About how many teachers participated in these teacher study groups?

26. Did you support teacher or other school staff in conducting individual research projects?
    1. Yes
    2. No (skip to 28)

27. About how many teachers or other school staff participated in these individual research projects?

28. Did you support any other activities?
    1. Yes
    2. No (skip to 30)

29. About how many teachers participated in these other activities?

EXHIBIT H.6.25d (Continued)

Items from SAHE-grantee Project Director Telephone Interview Used in Analyses Reported in Chapter 6

Targeting and recruitment

31. Of the teachers in your Eisenhower activities, what percent come to participate in each of the following ways?
    a What percent volunteer?
    b What percent are selected by their principal or other administrator?
    c What percent participate by rotation?
    d What percent come to participate in other ways?

35. Do you try to increase the participation of either teachers from historically under represented populations or teachers from specific types of schools (for example, teachers of low-income, limited English proficiency, or racial/ethnic minority students)?

36. How much emphasis do you give to recruiting Title I teachers for your activities?
    1. No particular emphasis
    2. Some emphasis, or
    3. Strong emphasis

37. How much emphasis do you give to recruiting special education teachers for your activities?
    1. No particular emphasis
    2. Some emphasis, or
    3. Strong emphasis

38. How much emphasis do you give to recruiting teachers of limited English proficiency students for your activities?
    1. No particular emphasis
    2. Some emphasis, or
    3. Strong emphasis

39. How much emphasis do you give to recruiting teachers from schools with low achievement levels for your activities?
    1. No particular emphasis
    2. Some emphasis, or
    3. Strong emphasis

40. How much emphasis do you give to recruiting teachers from high poverty schools (50 percent or more students eligible for free and reduced lunch) for your activities?
    1. No particular emphasis
    2. Some emphasis, or
    3. Strong emphasis

41. How much emphasis do you give to recruiting paraprofessionals for your activities?
    1. No particular emphasis
    2. Some emphasis, or
    3. Strong emphasis

EXHIBIT H.6.25d (Continued)

Items from SAHE-grantee Project Director Telephone Interview Used in Analyses Reported in Chapter 6

43. In which of the following ways do you try to increase the participation of teachers, paraprofessionals, or other populations? (Circle all that apply)

Do you....
- a. Publicize activities
- c. Use incentives
- c. Tailor the focus of professional development towards the needs of special populations
- d. Do you use other strategies?

Processes and procedures

46. In which of the following ways are teachers' needs for professional development assessed? (Circle all that apply)
- a. With a survey of teachers
- b. With meetings of teacher representatives
- c. With a survey of principals or department chairs
- d. With measures of student performance
- e. With informal conversations
- f. Are teachers' needs assessed in other ways (please specify)

47. Do you evaluate Eisenhower-supported professional development?
- 1 Yes
- 2 No (skip to 49)

48. In which of the following ways do you evaluate Eisenhower-supported professional development? (Circle all that apply)
- a. By number of teachers participating in professional development
- b. With a teacher satisfaction survey
- c. With observations of teachers
- d. With student achievement scores
- e. In other ways (please specify)

49. Are you aware of any performance indicators for professional development set by the state?
- 1. Yes
- 2. No (skip to 52)

51. Have they affected your Eisenhower project?
- 1. Yes. How have they affected your Eisenhower project?
- 2. No

52. Have the districts you work with developed performance indicators for professional development?
- 1. All have (skip to 54)
- 2. Most have (skip to 54)
- 3. Some have (skip to 54)
- 4. None have
- 5. Don't know

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EXHIBIT H.6.25d (Continued)

Items from SAHE-grantee Project Director Telephone Interview Used in Analyses Reported in Chapter 6

53. Are the districts you are working with developing performance indicators for professional development?
    1. All are (skip to 56)
    2. Most are (skip to 56)
    3. Some are (skip to 56)
    4. None are (skip to 56)
    5. Don't know (skip to 56)

55. Have they affected your Eisenhower project?
    1. Yes. How have they affected your Eisenhower project?
    2. No

59. Do any of the following ongoing feedback mechanisms exist between you and the district?
    a. Regular visits and observations of professional development activities by the district
    b. Telephone calls
    c. Regular required reports
    d. Required evaluations of professional development activities
    e. Other feedback mechanisms
    f. No ongoing feedback